A PHYSICAL DISSERTATION ON DROWNING:

IN WHICH

SUBMERSION, commonly call'd DROWNING, is shewn to be a long Time consistent with the Continuance of LIFE, from a Variety of unexceptionable tho' surprising FACTS, related by the most eminent and judicious Authors, and confirm'd by incontestable Evidence; which FACTS are reconcil'd and accounted for, from the strictest Laws of the Animal Oeconomy.

To which is SUBJOINED,

The proper Measures for RECOVERY and RELIEF; the Obligations we lie under to practise them are clearly suggested, and strongly enforc'd; intended for the Good of Mankind, by restoring Life to many Persons, who are erroneously supposed to be irretrievably drowned. Recommended particularly, to the Consideration of the Surgeons of the Navy and Army, who have frequent Opportunities of practising the Methods recommended.

With an APPENDIX, containing some METHODS for the Recovery of those who hang themselves, and of Children supposed to be born dead.

By a PHYSICIAN.

LONDON:

Printed for JACOB ROBINSON, at the *Golden-Lion* in *Ludgate-Street.*

MDCCXLVI.

A PHYSICAL DISSERTATION ON DROWNING.

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To which is SUBJOINED,

The most Modern Methods for RECOVERY and RELIEF; the Operations we do under to practise them are clearly and plainly, and plainly explored; intended for the Good of Mankind, by giving Life to many Persons, who are erroneously supposed to be irretrievably drowned. Recommended, particularly, to the Consideration of the Superiors of the Navy and Army, who have frequent Opportunities of practising the Methods recommended.

With an APPENDIX, containing some MEDICINES for the Recovery of those who hang themselves, and of Children supposed to be born dead.

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MDCCXLI.

A

DISSERTATION

ON THE

Recovery of PERSONS drown'd.

AS Truth in general is of the laſt Importance, not only in affording a noble and exalted Satisfaction to the Mind, but alſo in forming the Morals, and by that Means, promoting the moſt valuable Intereſts of Society; ſo nothing can be a greater Reproach to Reaſon, nor a more palpable Affront offered to its auguſt and venerable Author, than that ignoble and unmanly Turn of Mind, commonly known by the Name of *Credulity*, which is no more than an implicit Contempt of Reaſon, and all the mental Powers, producing a Propenſity to believe certain Tenets, Doctrines, or Facts, without that Degree of Evidence, which a Mind ſtudious of Truth ought to require.

But however odious *Credulity* may appear, when painted in her native Colours, ſhe is nevertheleſs,

if we may be allowed the Expreſſion, a *Spectre*, which haunts the various Claſſes and Diſtinctions of Mankind, under a Form ſo infatuating and alluring, as to ſeduce them from the plain and amiable Paths of Truth, and bewilder them in the dark and gloomy Labyrinths of Ignorance, Error, and Confuſion. This deplorable Obſervation is in no Inſtance more effectually verified, than in theſe very Men, who profeſs a ſacred Veneration for Reaſon, and pretend to go wherever Truth ſhall conduct them; for, we frequently find, not only antient, but alſo modern Philoſophers and Phyſicians, labouring with a pompous Shew of Learning and Ratiocination, to prove that Nature, by her ſtated and eſtabliſhed Laws, was capable of producing certain Effects, which Time has afterwards diſcovered never to have had any Exiſtence, except in the Imaginations of the Credulous, or in the chimerical Works of Authors, who forſaking Fact and Nature, have given a full Scope to their Fancy and Invention. Thus in former Ages it was keenly diſputed, how it came about, that a ſmall Fiſh, call'd the *Remora*, was capable of putting a ſpeedy Stop to a Ship under Full-ſail; but this pretended Fact has, by later and more penetrating Naturaliſts, been diſcover'd to be abſolutely falſe. And, no doubt, the ever memorable Rabbit-Woman of *Godalmin*, would have made a conſiderable Figure in the Annals of the *Royal Society*, and afforded Matter to the Members for copious Diſſertations on the Force of Imagination, if ſhe had prudently ceas'd Breeding a Day ſooner. This bad Piece of Conduct, has, however, thrown an almoſt irreparable Diſgrace upon *natural Knowledge*, by inducing the ſober and judicious Part of Mankind to imagine, that it was totally employ'd

in

in explaining Viſions and Chimeras. Therefore, if we intend to philoſophiſe in ſuch a manner as not to diſgrace Philoſophy, we muſt have Facts duly aſcertain'd, before we attempt to explain and account for them; ſince, according to *Kercher*, in his *Mund. Subterran.* Lib. 10. "'Tis as abſurd "in phyſical Matters, to philoſophiſe without "Experience, as it is for a blind Man to pretend "to judge of Colours."

Tho' from what has been ſaid, it ſufficiently appears, that *Credulity* is fatal to Truth, yet we obſerve in the Minds of ſome Men, an arrogant and preſumptuous *Scepticiſm*, which, admitting nothing but what is eaſy to the Conception of its Poſſeſſors, is no leſs prejudicial to the genuine Intereſt of Science, and Philoſophy; for, as, by the former we are expos'd to the Danger of adopting Error as well as Truth; ſo by the latter our Minds are, as it were, manacled, and hinder'd from giving a rational Aſſent to Things and Facts cloath'd with the moſt ſtriking and diſtinguiſh'd Characters of Evidence, for no other Reaſon, than that we cannot comprehend them. It is, for Inſtance, a culpable Diffidence, to diſbelieve the Poſſibility of a Perſon's retaining a latent Principle of Life, after he has remain'd ſome Hours, Days, and even Weeks under Water, ſince numerous Facts, related by the beſt Authors, vouch'd by the moſt candid Witneſſes, and recorded in the publick Archives of the moſt penetrating and ſagacious Nations, concur to remove the ſmalleſt Remains of Uncertainty in this Point. Beſides, I would have the Gentlemen of this Claſs remember, that their Conduct beſpeaks an inſupportable Degree of Pride, and amounts to a formal Declaration, that they themſelves are bleſſed with Geniuſes far ſuperior to others, ſince nothing can

be true, but what is comprehenſible by the vaſt Extent of their Capacities. And tho' Modeſty and Common-Senſe, ſhould not direct them to this Obſervation, yet what the World calls *moral Evidence* ſtands upon Foundations, too ſtable and ſure to be ſhaken by their frivolous Conceits, or ill-grounded Remonſtrances. In a Word, the wiſe and thinking Part of Mankind will always be induc'd to give their Aſſent to Facts ſeen by a ſufficient Number of Witneſſes, who have Senſe enough to guard againſt Impoſture themſelves, and Honeſty enough to ſay nothing but what is Truth to their Neighbours. All theſe advantagious Circumſtances attend the following Narrations, which, for the common Benefit of Mankind, have been collected from Authors of the greateſt Veracity, in order to ſhew, that there is often a Poſſibility of reſtoring drown'd Perſons to Life, after vulgar Prejudice, and a Want of ſufficiently extenſive Views with Reſpect to the Laws of the animal Oeconomy, have laid a Foundation for concluding them irretrieveably dead, and paſt all Hopes of Recovery.

Dr. *Brubier*, an eminent Phyſician of *Paris*, well known to the learned World, and highly eſteem'd for his Knowledge in his Profeſſion, about three Years ago, publiſh'd a Treatiſe on the *Uncertain Signs of Death*, tending to prove, that many People are interr'd before they are really dead; and that there are frequent Inſtances of Perſons who have liv'd many Days without Reſpiration, or any other apparent Signs of Life. This Doctrine he eſtabliſhes by many inconteſtable Hiſtories of People who have actually ſurviv'd their Funerals, and liv'd many Years after they had been buried, upon a Suppoſition, that they were actually dead. Hence he very judiciouſly infers,

that

that 'tis not imprudent but inhuman, to ſuffer the Interment of our Friends and Relations, before we are convinc'd from the moſt evident Marks, that they are certainly and irrecoverably deceas'd; or till ſuch time as the Beginning of Putrefaction convinces us, that no Hopes remain of a Revival.

In Confirmation of what this celebrated Phyſician has advanc'd, many Examples might be found in our own Country, which eſcap'd his Researches; and no doubt it happens much more frequently, than is generally imagin'd; eſpecially in hyſterical Women, in thoſe who have contracted a Habit of drinking ſpirituous Liquors to Exceſs, but particularly in thoſe who have been guilty (for ſo I can't forbear calling it) of taking frequent Doſes of Opium, or its Preparations, ſo as to render Life inſupportable without them, of which there are too many Inſtances.

This Doctrine, however true, is not altogether modern; for we learn from *Diogenes Laertius*, that the celebrated *Empedocles* acquir'd uncommon Honour, by reſtoring a Woman to Life who was thought to be dead many Days, and whoſe Diſorder he diſcover'd to be only a Strangulation of the Uterus, that is, an hyſteric Fit.

We learn, farther, that *Heraclides* of *Pontus*, a noted Philoſopher, wrote a Treatiſe upon this very Subject, which he intitled, Περὶ τῆς ἄπνοιας, *Of the Diſtemper in which the Patient is depriv'd of Reſpiration.* In this he aſſerted, that the Diſorder might continue thirty Days, during which there was no Reſpiration, or any other Signs of Life, without any Marks of Putrefaction; and that notwithſtanding, the Patient might at laſt recover.

In Conſequence of the frequent Interments of People before they were really dead, Dr. *Brubier*, in

in 1745, publiſh'd a ſmall Pamphlet, containing Propoſals for the Regulation of Funerals, and the Prevention of ſuch calamitous Diſaſters; which he endeavours to have confirm'd by the Legiſlature; for, ſays he, how many Women weary of their Huſbands, and Huſbands equally weary of their Wives; how many Children who have either a real or an imaginary Reaſon to be diſſatisfied with their Parents; and, eſpecially, how many covetous and neceſſitous Heirs, who have long waited for the happy Moment, which was to put him in Poſſeſſion of an opulent Fortune, may not abuſe the Liberty the Law affords them of burying their Friends at the End of twenty-four Hours, at which Time they may, poſſibly, be really alive, and capable of a Recovery. And to prove this Regulation the more neceſſary, he relates the following Hiſtories.

A Woman about eighty Years old, being taken for dead, was about to be laid out as ſuch, when a Perſon, who had perus'd his Treatiſe, oppos'd the Deſign. Next Morning the Woman was found recover'd from her profound Syncope, which, conſidering the intenſe Cold of the Seaſon, had probably prov'd a real Cauſe of her Death, had ſhe been taken out of her Bed.

It is alſo ſufficiently known, that Cardinal *Spinoſa*, firſt Miniſter to the King of *Spain*, being ſuppoſed dead, and committed to a Surgeon in order to be embalm'd, thruſt away the Hand which conducted the fatal Inſtrument, which put a real End to his Life. But notwithſtanding this Accident, the barbarous Surgeon proceeded to finiſh the Operation.

But as Submerſion, or Drowning, is the Subject of our preſent Enquiry, I ſhall only farther take Notice of the Hiſtories relating thereto.

The

The celebrated *Kunckel*, in *Ephemerid. Nat. Curioſ.* informs us, that a young Man had the Misfortune to fall from a Boat into the Water, and ſunk to the very Bottom, about fifteen hundred Paces, from the Shoar, which he did not reach till two Hours after. However, as it is natural for Perſons to give an Account of the ſeveral Circumſtances attending their reſpective States of Calamity and Diſtreſs, the young Man inform'd thoſe who had the Curioſity to enquire into his Condition during that Time, that whilſt he was making the moſt ſtrenuous Efforts to preſerve his Life, he thought of nothing but God, and the Means of recommending himſelf to his Favour and Acceptance; that the Voice of his darling Siſter, who wept bitterly on the Shore, for the Fate of her Brother, had ſerv'd to conduct him to the Land; that the Diſturbance of the Water by thoſe who fought for him, and the Lamentations of the People on the Shore, were not only diſtinctly heard by him, but alſo prov'd extremely ſhocking and uneaſy to him; that he thought his Reſpiration was carried on, without his knowing in what Manner, that the Water had not penetrated into any of the Cavities of his Body; and that he was hot, inſtead of being cold.

The ſame judicious Author informs us, that he had an Opportunity of examining a Fiſherman, who fell from a Boat into the ſame Place, and was, by Means of the Ice, kept under Water for three Days, but upon his being found, appear'd full of Vigour, ſaid that he enjoy'd good Health, and affirm'd, that the moſt remarkable Circumſtance of which he had been conſcious was, that a large Bladder had been form'd around his Head for his Preſervation.

The

The memorable Accident which befel the *Swiss Diver* is so well attested, and accompanied with such a peculiar Train of Circumstances, that it cannot fail to make the most lively Impressions upon every Person capable of the smallest Degree of Reflection. As Necessity lays a Foundation for Industry, which frequently cannot be employ'd, but in a manner, which is either prejudicial to Health, or fatal to Life, so this adventurous Man follow'd the Business of plunging into the Water, and searching those Holes in which he imagined the larger and better Sort of Fishes were lodg'd. Accordingly, being employ'd as Dr. *Brubier* relates the Story, to furnish a Dish of Fish for a Company, who intended to regale themselves with a fine Dinner, he cheerfully undertook the Task. His Employers, in the mean Time, accompanied him to the Brink of the River, and seeing him plunge into the Water, retir'd, not in the least doubting but he would keep his Word. The *Swiss*, however, happening not to bring the Fish at the Hour appointed, the Company, when the Afternoon was pretty far advanc'd, went to the Banks of the River, in order to know the Reason of their Disappointment. As the Clothes of the Diver lay on the River-side, so they soon suspected his deplorable Fate, and accordingly order'd him to be search'd for with Hooks, in the Place into which they had seen him plunge. The Efforts for this Purpose were not in vain, for he was at last found, and taken out of the Water, tho' wounded in several Parts.

As this unfortunate Man had been under Water for nine Hours, so the Curate of the Place, whose Profession call'd for some Care of a Person in such a Situation, had a Mind that he should be forthwith interr'd; and he had been infallibly committed

ted to the Grave, had not the celebrated Mr. *Egly*, a Member of the Royal Academy of *Inſcriptions*, who obſerv'd a Kind of Ebullition in the Water diſcharg'd from his Mouth, poſitively affirm'd that he was not dead. For that Gentleman juſtly aſcrib'd this Ebullition to the languid and imperceptible Remains of Reſpiration.

This Conduct of Mr. *Egly*, however uncommon, yet made ſo deep an Impreſſion upon the Spectators, that they carried the unfortunate Diver, into an adjacent Houſe, where having laid him out at full Length, they compreſs'd his Abdomen, in order to procure a Diſcharge of the Water he had ſwallow'd. By this Means having in three Quarters of an Hour evacuated a conſiderable Quantity of Water, he mov'd one of his Legs, a Circumſtance which ſufficiently evinc'd that he ſtill retain'd ſome faint Remains of Life. For this Reaſon he was, by Mr. *Egly*'s Orders, wrap'd up in warm Sheets, and gradually reſtor'd to a natural Heat. Then being laid in a warm Bed, and his Life becoming gradually more conſpicuous, a liberal Veneſection was made, which was ſucceeded by a Sigh, then by a ſlight Knowledge of what had befallen him, and ſoon after by a total Reſtitution of Health; and tho' Gratitude is rarely to be met with in the Breaſts of the Vulgar, yet this important Service, ever after touch'd the Heart of the *Swiſs*, with the higheſt and moſt lively Senſe of the Obligations he lay under to Mr. *Egly*.

Mr. *Durham*, a Gentleman ſufficiently celebrated for his untainted Integrity, and extenſive Learning, in his *Phyſico-Theology*, quotes the following Hiſtory from *Pechlinus*, an Author of no leſs Candour and Reputation.

About eighteen Years ago, a Gardner of *Fruningholm*, now ſixty-five Years old, and ſufficiently vigorous and robuſt for a Perſon of that Age, made a generous Attempt to reſcue an unfortunate Neighbour who had fallen into the Water; but being too fool-hardy, he ventur'd upon the Ice, which broke, and let him fall into the River, which at that Part was eighteen Ells in Depth: He went perpendicularly to the Bottom, in which his Feet ſtuck for ſixteen Hours before he was found. He himſelf ſays, that he was no ſooner under Water, than he became rigid, and loſt not only the Power of Motion, but alſo all his Senſes, except that of hearing, which was affected by the Ringing of ſome Bells at *Stockholm*. He at firſt, alſo perceived a Kind of Bladder before his Mouth, which hinder'd the Ingreſs of the Water by that Paſſage, tho' it enter'd freely into his Ears, and produc'd a Dulneſs of Hearing for ſome Time after. This unfortunate Man was in vain ſought for during ſixteen Hours, at the End of which Time he was taken up by Means of an Hook fix'd in his Head, and upon his total Recovery ſaid, that he was ſenſible of that particular Part of his Fate. However, whether from the prevailing Cuſtom of the Country, or the Perſuaſion of particular Perſons, certain Attempts were made in order to reſtore him to Life: For this Purpoſe he was wrap'd up in Blankets, leſt the Air entering too precipitately into his Lungs ſhould prove fatal to him. In this Condition, being gradually warm'd by Means of Sheets, he was rubb'd and ſtimulated till the Motion of his Blood, which had been check'd for ſo many Hours, return'd. At laſt he was totally reſtor'd by Means of Cordials, and antiapoplectic Liquors. He as yet bears the Mark of the Hook, and ſays, that he is ſtill ſubject to violent

lent Head-achs. This ſingular Accident, atteſted by the Oaths of Perſons who had been Eye-witneſſes to it, induc'd the Queen to give him an annual Penſion, and he was introduc'd to the Prince, in order to give an Account of what had befallen him.

The celebrated *Pechlinus* has wrote the Hiſtory of a Woman, who remaining under Water for three whole Days, was happily reſtor'd to Life, almoſt in the ſame manner as the Gardner. This Fact, was ſo notorious, that the learned *Tilaſius*, Library-keeper to the King of *Sweden*, and in whoſe Time the Woman was ſtill alive, gave the following Certificate of it, which is ſtill kept in the Archives of the *Acad. Natur. Curioſ.*

There lately was in Dalia, *commonly called* Wormſland, *a Woman of the Name of* Margaret Larſdotter, *who having the Misfortune to be thrice drown'd, remain'd the firſt Time, ſhe being then young, for three whole Days under Water, but the two other Times had more ſpeedy Relief afforded her. She died in* 1672, *in the ſeventy-fifth Year of her Age.* Telaſius.

Tho' this Accident, and the Delivery from it, happening ſo many different Times to the ſame Perſon, may by ſome be look'd upon as fabulous and romantic, yet upon the whole it appears to be cloath'd with the moſt genuine Character of Truth and Evidence; for is it credible, that a Man of Probity, Candour, and Learning, as we may readily ſuppoſe the Librarian of a rich and powerful Monarch to be, ſhould in a manner ſo poſitive and circumſtantial, dare to affirm a Fact, which was only ſuſpected, and much leſs one that was abſolutely falſe? Is it probable that a Man of *Pechlinus*'s Character, who is no leſs univerſally than juſtly

applauded for his extenſive Erudition and conſummate medicinal Knowledge, ſhould compoſe an elaborate Treatiſe in order to explain the Poſſibility of this Fact, without taking due Pains to have its Reality ſufficiently confirm'd and aſcertain'd? or, in a word, is it to be ſuppoſed, that this Phyſician, who was look'd upon as the Glory and Ornament of the *Swediſh* Nation, ſhould have the Impudence, to appeal to all the *Literati* of *Sweden*, for the Truth of a Fact, which had not the Sanction of ſufficient Evidences? Why ſhould we be more ſcrupulous than *Pechlinus*'s contemporary Authors, who never call'd the Truth of this Fact in Queſtion? The celebrated *Bartholin*, in *Act. Med. Haffn. Tom. 3. Obſ.* 42. ſpeaks of it in the following manner; "I can by no Means "remain diffident with reſpect to the Truth of a "Story confirm'd by the concurring Teſtimonies "of ſo many Witneſſes of Candour and Veracity; and of which *Pechlinus* has demonſtrated "the Poſſibility by other Examples of a ſimilar "Nature: I am only ſurpris'd, that ſo ſingular a "Narrative, ſhould be ſo long buried in Oblivion, "in a Nation otherwiſe ſo curious and fond of "Diſcoveries."

But we ſhall have no manner of Reaſon to doubt of this Fact recorded by *Pechlinus*, when we reflect, that other celebrated Phyſicians and Philoſophers, aſſure us of the Truth of other Accidents highly ſimilar and analogous to it. Thus *Alexander Benedictus*, Lib. x. Cap. 9. ſpeaks in the following manner. "Life has been frequently ſeen "reſtor'd to Perſons who have remain'd under "Water during forty-eight Hours." The ſame Author, for this very Reaſon, thinks it highly improper, to inter drown'd and hyſteric Patients, till ſeventy-two hours after their ſuppos'd Death.

Borelli,

Borelli, in *Cent.* 2. *Obſ.* 2. informs us, that, "a cer-
"tain Perſon of Diſtinction having remain'd for
"a long Time under the Water, was taken for
"dead when he was found: but proper Efforts
"being made to reſtore his Life, he was rous'd
"from his ſuppos'd Death, and long ſurviv'd his
"Misfortune." Beſides, the Credibility of the Fact, told by *Pechlinus*, is ſufficiently confirm'd by the Suffrage of the learned and judicious *Zacchias*, who, in his 79th Conſultation, wrote in order to determine, whether the Return of Life to a young Man who had remain'd an Hour under Water, was miraculous, and as ſome ſuperſtitious People would have it, to be aſcrib'd to a Perſon of ſuperior Sanctity, ſpeaks in the following manner. "This Event is ſo far from being
"miraculous, that it can hardly come under the
"Denomination of ſurpriſing, ſince vaſt Numbers
"of Perſons have return'd to Life, after having
"been drown'd, or ſuffocated in any other man-
"ner, not only for ſome Hours, but alſo during
"one, and even three whole Days; becauſe the
"Suppreſſion of Reſpiration in the Water, had
"occaſioned an Oppreſſion of the Spirits, and
"had brought on an apoplectic Paroxyſm, which
"render'd them apparently dead, tho' their Lives
"were really preſerv'd by Tranſpiration, which
"augmenting gradually, laid a Foundation for
"a free Reſpiration."

The Poſſibility of retaining a Principle of Life for a long Time under Water, is ſtill more ſurpriſingly confirm'd by *Kunckel*, in *Miſcellan. Nat. Curioſ. Decad.* 3. *An.* 5 & 6. *Obſ.* 71. where he ſpeaks in the following manner. "I am ſuffici-
"ently ſenſible, that in *Sweden*, no one Doubts of
"the Poſſibility of retaining Life under Water for
"eight Days; and that the following Accident is

"by

" by no Means call'd in Queſtion by thoſe who
" live near the Place where it happened. Some
" Time ago, about four Leagues from the Town
" of *Falung*, a Painter fell from a Boat into the
" Water in ſuch a manner, as to remain upright
" with his Feet at the Bottom. He was in vain
" ſearch'd for during eight Days; at the End of
" which Time, he appear'd alive on the Surface
" of the Water. The Magiſtrate and Clergyman
" of the Place, aſk'd him the following Queſtions.
" Whether he had reſpir'd all the Time of his
" Submerſion? To which he anſwer'd, He knew
" nothing of the Matter. Whether he had thought
" upon God and recommended his Soul to him?
" To which he reply'd, Very often. Whether he
" could ſee and hear? To which he anſwer'd,
" Yes, and ſaid that he would often have laid
" hold of the Hooks employ'd in finding him, if
" he could have mov'd his Arms. He alſo, add-
" ed, that the Fiſh prov'd highly offenſive and
" uneaſy to him, by the Attacks they made on his
" Eyes; and being aſk'd by what Means he guard-
" ed againſt theſe Attacks, he anſwer'd, by mov-
" ing his Eye-lids. As to his Senſe of hearing,
" he affirm'd, that nothing was more ungrateful,
" and even painful, to him than ſtriking the Sur-
" face of the Water; and that in a particular man-
" ner, he was affected with a violent Pain of his
" Ears, which was forthwith communicated to his
" whole Body, every Time People came to draw
" Water in Buckets. When he was aſk'd, Whe-
" he had been ſenſible of Hunger, and diſcharg'd
" his Excrements? He reply'd, that he had not.
" Being interrogated, Whether he had ſlept? he
" anſwer'd, he knew nothing of it, but believ'd
" he had, becauſe he was ſome times depriv'd of
" all Senſation and Reflection; adding, that all

" the

" the Thoughts he remember'd to have pass'd in " his Breast, had only God, and the Means of " his own Deliverance, for their Objects."

The Nature and Circumstances of the Accident now related, lay a sufficient Foundation, for our believing the following memorable Event, especially as it happened to a Person of Distinction, and is attested as authentic by Men of Learning and Probity.

Gocellinus, a young Man, and Nephew to one of the Archbishops of *Cologne*, had the Misfortune to fall into the *Rhine*, and was not found for fifteen Days after; and being laid in an adjacent Church, in order to be interr'd, soon return'd to Life, and surviv'd the Accident a long Time.

As there are a great many secret Things in Nature, and probably numberless latent Circumstances in the animal Oeconomy, with which we are entirely unacquainted; and as Persons of a curious and attentive Turn of Mind, daily observe Accidents, which they before thought impossible, so we have no Reason to doubt of surprising Facts, related by Men of Learning and Candour, nor formally to deny the Truth of Events, which at first appear incredible. Of this Kind, is the following Narrative.

The celebrated Mr. *Burmann* assures us, that in *Bonesi* of *Pithovia*, he heard a funeral Sermon preach'd upon the Death of one *Laurence Jones*, a Man of seventy years of Age, who as the Preacher said, was drown'd when sixteen Years old, and continued seven Weeks under Water, notwithstanding which, he return'd to Life, and enjoy'd good Health. However visionary and romantic this Accident may appear, in the Eyes of those who pretend to have divested their Minds of vulgar Errors, yet it has met with Credit from the most penetrating

netrating and ſagacious Authors who liv'd at the Time in which it happen'd. Thus the learned and judicious *Langelott*, in *Miſcellan. Natur. Curioſ. Decad.* i. *An.* 6. *Obſ.* 20, not being able to conceive how a Perſon can preſerve a Principle of Life ſo long, without the Aſſiſtance of the Air, in Waters ſo cold and full of Nitre, as thoſe of *Sweden*, and not being ſatisfied with ſimilar Accidents daily happening to ſome Birds and Inſects, is yet ſo far from doubting of the Truth of this Accident, that he applies to the learned Members of the *Acad. Natur. Curioſ.* for their Opinion and Explication of it; by which Means he imagin'd that effectual Meaſures for reſtoring many drown'd Perſons might be diſcover'd. Beſides, it is by no Means probable that a Man of Mr. *Burmann*'s Veracity would forge ſuch a Story, in order to ſee what enormous Lengths Credulity was capable of carrying his Fellow-Creatures; nor is it poſſible that the Clergyman, ſhould, from the Pulpit, aſſert this Fact as true, if it had not really been ſo, ſince *Laurence Jones*, was a Native of the Place, and well known to every one of his Audience.

But upon the Whole, granting that this Narrative of *Laurence Jones* was falſe, which however we have no Reaſon to believe, yet the Recital of it has a great Tendency not only to illuſtrate our Subject, but alſo to produce happy Effects in Life; for, 1ſt, It is certainly the genuine and uncontroverted Intereſt of the Public, to be appriz'd of the Poſſibility of a Perſon's retaining a Principle of Life for a long Time under Water; 2dly, The Concluſion to be drawn from this ſeemingly miraculous Effect is, that if after a long Time, a Body is taken out of the Water, without the Signs of Putrefaction, it is the Duty of thoſe who find ſuch a Body, to treat it as if there were ſtill a

Poſſibility

Poſſibility of reſtoring it to Life; and 3dly, If it is certain from uncontroverted Facts, that Perſons have retain'd Life under Water for ſeveral Days, there is no Reaſon, from the Laws of the animal Oeconomy, and the hitherto known Properties of the animal Fluids, to diſbelieve that the like ſhould happen to Perſons who have alſo remain'd under Water for ſeveral Weeks.

As our Modeſty ought always to be proportion'd to the difficult and intricate Natures of the Subjects we pretend to conſider, ſo we frankly acknowledge, that theſe and other ſimilar Accidents, as it were, bewilder the Mind, and perplex the moſt penetrating Capacities, when they attempt to account for them; ſince we have never yet diſcover'd wherein the conſtituent Principle of Life exactly conſiſts, and ſince there are various Properties both of the Solids and Fluids of the human Body, to which we are intire Strangers. Some however, affirm, that a Principle of Life may in the deplorable State of Submerſion, be retain'd for a long Time, becauſe the Coldneſs of the Water renders the Circulation ſlower, and ſuppreſſes the Tranſpiration of the vital Air contain'd in the Blood; whilſt at the ſame Time, ſome Portions of the Air lodg'd in the Water, probably penetrate into the Bodies of ſuch Perſons. But *Platerus* and *Bartholin* ſeem to account in a more rational and ſatisfactory manner for Phænomena of this Kind. The former of theſe Authors, in explaining how a Woman, who was drown'd in the *Rhine*, for murdering her own Child, return'd to Life after ſhe was found, affirms, that this Accident was the Effect of a Syncope, in which Reſpiration and the Motion of

the Heart are ſtopt. Now 'tis certain from Experience and Obſervation, that theſe two Functions may be ſuppreſs'd without the actual Loſs of Life, as is frequently obvious in violent Syncopes, and hyſteric Paroxyſms, from which the Patients do not often recover in an Hour or more, during which Time, the ſlighteſt Indications of Life by the Pulſe and Reſpiration, are not to be obſerv'd.

If any one ſhould ſay, that it beſpeaks an unpardonable Exceſs of Credulity, to believe that a Syncope may laſt for a Week or longer, and that conſequently the Motion of the Heart and Pulſe may be for that Time ſuſpended, without neceſſarily producing Death; we may juſtly reply, that hitherto no Perſon has diſcover'd wherein the Eſſence and Principle of Life conſiſts; and that there are in Nature various Phænomena, which ſeem to prove, that the Motion of the Heart, and the Circulation of the Humours, are rather palpable Signs of the Exiſtence of Life, than its proximate and immediate Cauſes. This Doctrine we ſhall endeavour to eſtabliſh, in a ſtrictly analogical manner, by comparing thoſe Events which happen to Vegetables and the Brute Creation, with ſimilar Accidents which befall Mankind.

For this Purpoſe we ſhall firſt conſider the State and Condition of ſuch Plants, as retain a Principle of Life and Vegetation during the whole Winter. All the Difference, according to *Pechlinus*, between theſe, and the Plants of the animal Kind is, that in the latter the Principle of Motion is weaker, and the Texture of the Fibres leſs firm; whereas the former contain a much larger Quantity of Oil, and have the Spirit ſubſervient to their Vegetation repell'd by the Cold, to the Bulbs, Roots,

Roots, and Seeds, where it circulates in a languid manner, without having Force to propel Buds, Flowers, and Bloſſoms, till the kind and genial Heats of the Spring, render it more powerful and active. Why may we not, therefore, ſuppoſe that ſomething analogous to this may happen in ſome human Bodies, who have been under the Water for ſome Time.

This is not the only Inſtance in Nature, which we can bring in Confirmation of our Doctrine; for certain Inſects paſs the whole Winter in *Chryſalides*, or conſiderably hard Pellicules, without diſcovering the ſmalleſt Signs of Life, tho' 'tis certain they are not dead, ſince a ſmall Degree of Heat only, is requiſite to produce their laſt Metamorphoſis. The Reaſon of this apparent Death, is the Cold of the Atmoſphere, ſo inſpiſſating their Fluids, as that they can only circulate in a faint and languid manner, round an highly minute and ſmall Center. The Degree of Fluidity which they retain, is however, ſo conſiderable, that a more intenſe Cold than we perceive on the Earth, is incapable of totally coagulating them, as is ſufficiently evinc'd by the curious Experiments of Mr. *Reaumur*.

This Phænomenon is not only obſerv'd in the *Chryſalides* of Inſects, but the *Seminal Principle* is alſo preſerv'd free from Coagulation, and without diſcovering the ſmalleſt Sign of Life, in Eggs, which may be conſider'd as the *Chryſalides*, or Pellicules of Animals, whoſe Life is perceptible. Aquatic Inſects, alſo, plunge themſelves into the Mud, where they remain without Motion, till the Spring; which holds equally true of Frogs and Toads, according to *Valentinus*, in *Diſſert. Epiſtol.* 4.

The like happens to some terrestrial Insects; for Mr. *Reaumur* has by Experiment and Observation sufficiently evinc'd, that Ants during the whole Winter, remain apparently dead, till the Approach of the Spring.

A third and more powerful collateral Proof of this Doctrine, is drawn from the Consideration of some Animals, whose Blood is warm, and circulates in the same manner with that of the Human Species; since in these also the Circulation and Respiration are suppress'd during the Winter, but return in the Spring.

Thus of Swallows it may be said, that during one Half of the Year they are dead, and the other alive. *Olaus Magnus*, and *Scheffer*, in a Letter wrote to *Hevelius*, affirm, that in some northerly Countries, it is very common for Fishermen to find in the Water large Clusters of Swallows, which in the Beginning of the Autumn, had thus pil'd themselves up. Those Authors also inform us, that some Species of Swallows, spontaneously seek a Refuge in the Waters, others take their Flight to foreign Climates, others conceal themselves in the Holes of old and decay'd Buildings, in the Sand, and in their own Nests; and that others finding a Decay of Strength in their Passage to other Countries, plunge themselves into the Sea, where they remain till the genial Spring rouses their latent Principle of Life and Motion.

The celebrated *Kircher*, in *Mund. subterran.* Lib. 8. Sect. 4. informs us, that the Inhabitants of *Peloponesus*, and other Territories of the *Archipelago*, have told him, that every Year, they observ'd large Quantities of Storks and Swallows flying thro' their Countries from *Egypt* and the

Coasts

Coasts of *Lybia*, and that these latter when fatigu'd with flying, plac'd themselves, to the number of five or six, on the Back of a Stork, whom they recompens'd by an uninterrupted and melodious Song. There, are, therefore, continues the Author, some Swallows which fly from one Country to another; but 'tis equally certain from Experience, that the Swallows of cold Climates make no such Voyages, but during the Winter conceal themselves in Caves, Lakes, Rivers, Seas, and the Cavities of Trees.

Olaus Magnus, in Lib. 15. Chap. 10. informs us, that such Swallows as are taken out of the Water before the due Time, do not live long: and adds, that the Inhabitants of *Tivoli*, when shewing him Mount *Sciffa*, which Name it receives from a foolish Report of its being divided at the Crucifixion of our Saviour, assur'd him, that in the Winter-Season, large Quantities of Swallows apparently dead were to be found on it; whereas no such Animals are to be found there in Summer. He then quotes *Cysatus*, who in his Description of *Switzerland* affirms, that about *Christmas*, some Workmen when digging up the Earth for laying the Foundation of a public Edifice, found a subterraneous Cave, from which flew about twenty or more Swallows. Whence the Author concludes, that all these Birds do not pass the Sea at their Disappearance, but that some retire into the Cavities of Mountains, others in Hollow Trees; but that this most frequently happens in northerly Climates.

Fortunius Licetus, in *Tr. de Feriis Altric. Animal. Diss.* 19. affirms, that in upper *Poland*, every Person may be experimentally convinc'd, that the same

ſame Swallows which in Summer build their Nests upon the Tops of Houſes, towards the End of *September* plunge themſelves into Ditches and Rivers, where they remain conceal'd till about the Middle of *May*. He, alſo, informs us, that when the Inhabitants ſeeing Fiſh thro' the Ice, break it in order to catch them, they alſo frequently find Cluſters of Swallows adhering to each other, without diſcovering the ſmalleſt Signs of Life, till they are brought to a Stove, where they ſoon return to Life. But what is ſtill more remarkable is, that as ſoon as the *Polanders*, who imagine it unlawful to kill theſe Swallows, ſet them at Liberty, they forthwith fly back to the Water, and plunge themſelves into it.

The celebrated *Huet*, Archbiſhop of *Avranches*, who travell'd thro' *Sweden*, informs us, that between *Caen* and the Sea, along the Shore of the River *Orne*, there are many Caves, in which, during the Winter, have been found large Cluſters of Swallows, ſuſpended like ſo many Bunches of Grapes; and that the like was long ago obſerv'd in *Italy*. For *Pedo Albinovanus*, in the Elegy he compos'd on the Death of *Mecænas*, ſpeaks of the Retreat of the Swallows to the Rocks, as an infallible Sign of the Approach of Winter.

"Congelantur Aquæ, ſcopulis ſe condit Hirundo,
"Verberat egeledas garrula vere Lacus."

Bodin, quoted by *Camerarius*, *Cent. 7. Hiſt. 71.* informs us, in the ſecond Book of his *Theatre of Nature*, that when the People who inhabit the Coaſts of the *Baltic* Sea, are employ'd among the Rocks in ſearching for yellow Amber, they frequently

quently find large Clusters of Swallows. *Camerarius* subjoins, that some Authors affirm, that "Swallows conceal themselves in the Bottom of the Sea, where they sleep till the Appearance of a proper Season for their quitting it; but this is impossible since they have Lungs, and for that Reason must necessarily perish in such a Condition." But however specious and conclusive this Reasoning of *Camerarius* may appear, yet 'tis certain that the Truth of Facts, which have actually happened, can never be invalidated.

Franciscus de Frankenau in his Medicinal Satyres, confirms this Opinion with Respect to Swallows, by the Authorities of *Langemberg*, in *Acur. Philol.* Lib. 3. Cap. 71; of *Isaac Vossius*, in his *Append. de Lucis Natur.* Cap. 1; of *Deusingius*, in *Vindic. Fat.* Sect. 5; and of *Fournier*, in his Geography, who in Part 1. Lib. 2. Cap. 5. informs us, that they are commonly found in the *Norwegian* Seas, as also in the Lakes and Rivers of *Silesia*, *Poland*, *Bohemia*, and *Moravia*; and that in the Beginning of the Autumn, large Numbers of them plunge themselves into Wells. The same Author, also, establishes his own Opinion by the additional Suffrages of *Cromerus*, in *Hist. Polon.* Lib. 1; of *Hevelius*; of *Marcellus Donatus*, in *Hist. Med. Memorab.* Lib. 4. Cap. 12. and of *Helvicius*, in his Epigrams.

The celebrated Mr. *Falconet*, whose Judgment and Veracity render his single Word a sufficient Evidence, informs us, that being in the House of a Gentleman of *Brest* in the Winter Season, he saw a Servant bring in a Kind of Mass or Lump, which appeared to be Earth, and which some Fishermen had caught in their Nets. By washing it carefully, in

in order to discover what it was, it was found to be a Group of Swallows, which return'd Life by being expos'd to the Fire for some time.

Swallows are not the only Birds which conceal themselves in the Bottoms of Rivers, in order to pass the Winter; for *John Baptiste de Fulgosa*, formerly Doge of *Genoa*, affirms, that *Gervas Tibellius*, wrote to *Otho* the Fourth, that some Persons having thrown their Nets into a River of that Country in the Winter Time, they brought to Land a large Quantity of Storks, which were apparently dead, with their Beaks fix'd in each other's Fundament; but they were soon restor'd to Life, by means of Heat. The same Author adds, that in 1467, near *Metz* in *Lorrain*, a large Number of apparently dead Storks were found in a River, and that being put into a warm Bath, they recover'd Life.

The learned *Vossius*, in *Append. de Lucis Natur.* informs us, that at the Approach of Winter, Storks, Herons, and some other Birds of the like Nature, do not fly to *Egypt*, or into more temperate Climates, but plunge themselves into Ditches and Marshes.

The Possibility of retaining Life for a long Time under Water, is still farther evinc'd, by considering those Birds with which our Fields and Forests are richly stock'd in Summer; but which are not to be seen in Winter. If it should be said, that these, during the Winter, live upon the Stores they have amass'd in the Summer; I answer, that they are by no Means provident against future Want. Hence they must necessarily conceal themselves, in Places suited to their particular Natures; and as it is equally impossible for them, as for the human Species, to live awake

awake without Aliments, 'tis more then probable that during the whole Winter, they are, as it were, lock'd up in so lethargic a Sleep, that they sustain no Loss or Dissipation of their Fluids, and consequently require no Reparation.

If it should be ask'd, whether these Animals, during such a State, retain a real Principle of Life? I answer, that the Thing is not only probable, but may be also evinc'd from Fact and Experience, since the most celebrated natural Historians and Physicians give us strong and uncontroverted Instances of this Kind. Thus in *Ephemerid. Nat. Curios.* we are inform'd, that a certain Gentleman in the Winter Season, order'd an hollow Trunk of a Sallow Tree, which by his Direction had been cut down the preceding Autumn, to be laid on the Fire; but a small Portion of it happening to be left in a Corner of the Room, he had the Curiosity to examine it, and upon his doing so, found Feathers arrang'd and dispos'd in a natural Manner: These he gently pluck'd off, and underneath found the Flesh of a small Bird which he believ'd to be dead, though he could not discover to what Species it belonged. However, with respect to this Circumstance, he was soon undeceiv'd; for having expos'd it to the Influence of the Fire, it soon discover'd palpable Signs of Life. Something similar and analogous to this, no doubt, happens with respect to many of those Quadrupeds which inhabit our Forests, for Want of a Nourishment proper to give their Blood that Degree of Fluidity, which is absolutely necessary to its Circulation, since it is certain, that a far smaller Number is to be seen in Winter than in Summer.

After these Examples of an apparent Death in Birds whose Blood is warm, we have no Reason to be surpriz'd at *Pechlinus*, when he affirms, that in

the Winter Time, Fishes not only appear dead, but are consequently cover'd over with a Crust of Ice in their Holes, without having the vital Principle destroy'd in them; for they begin to live afresh, when the Heat of the Atmosphere, or an artificial Fire, melts the Ice. The like, continues the Author, happens to Serpents, Toads, Frogs, Tortoises, and in a Word all amphibious Animals, when the Cold inspissates their Juices, which being naturally viscid, are consequently more proper to prevent the Dissipation of that vital Spirit, which is absolutely necessary to restore them to Life.

'Tis to be observ'd, that those Fishes which have been thus frozen, do not long survive their artificial Resuscitations to Life, because the Frost having alter'd the Principles of their Blood, the vital Spirit, when beginning to act and unfold itself, can no longer form a Mass of Fluids of an uniform Nature. Thus Wine when frozen, and artificially thawed, contracts a disagreeable Flavour, because the Solution being procur'd in an unnatural Manner, hinders the spirituous Part of the Wine from mixing with its other Principles, in the same Order and Proportion as before.

What *Bartholinus* advances with Respect to Fishes, is entirely conformable to the Opinion of *Theophrastus*, in *Trade Piscibus in sicco degentibus*, where we are inform'd, that the Inhabitants of *Pontus*, frequently find Fishes in the Ice, which discover no Signs either of Motion or Sensation, till they are put into a Fish-Back, or laid among Straw. This Circumstance, according to *Theophrastus*, happens particularly to the Gudgeon, and some other Fishes of a similar Nature.

The last Proof of the Possibility of a Person's retaining a Principle of Life for a long Time under Water, without a Supply of Aliments for the Pur-

Purposes of Nutrition, is drawn from a Consideration of some Quadrupeds, as the Hedge-Hogg, the Marmotte, the Dormouse, and some others, which in the Beginning of Winter conceal themselves in the Earth, are said to be so profound a Sleep, that they appear to be dead, since neither the Pulsation of their Arteries, nor their Respiration are perceptible. This Circumstance, no doubt, induc'd the celebrated *Harvey* in his *de Generat. Animal. Exercit.* 50. to speak in the following Manner: "Some sanguineous Animals "live long without any Pulse, and lie conceal'd "during the Whole of the Winter, notwithstand-"ing which they remain alive, tho' their Heart "retains no Motion, and their Respiration stops, "just as it happens to Persons attack'd with Sin-copes, and hysteric Fits, whose Pulse is totally a-bolish'd." Tho' *Harvey* was the glorious Discoverer of the Circulation of the Blood, and may for that Reason be suppos'd to be a keen Advocate in its Behalf, yet 'tis sufficiently obvious from this Passage, that he did not believe it absolutely necessary to the Preservation of Life. But *Perrault*, whether from Prejudice, or rational Deductions from what he had observ'd, is of Opinion, that in these Animals, Respiration is carried on by a Motion of the Diaphragm, so insensible as to escape the Eye of the Observer. He also observes, that in this State, it is necessary their Respiration should be such, because if it was perform'd in the usual Manner, the Motion of the Blood would be so likewise; in consequence of which, the Transpiration and Necessity for Aliments would be equally strong; a Circumstance incompatible with the Condition of these Animals, which lie hid under the Earth during the whole Winter.

Tho' these Relations may possibly appear very singular and surprising to Persons unacquainted with Natural History; yet they infallibly prove, that in the brute Creation at least, Respiration, the Circulation of the Blood, and Pulsation of the Arteries may cease for a long Time, without the total Extinction and Destruction of Life. Now is it not highly probable, or rather absolutely certain, that something similar and analogous to this may happen to human Creatures, who have the Misfortune to be drown'd, since in both, the Solids and Fluids act and move by the same Laws, so in both Suffocation must be the same Thing, and consequently its Effects remov'd by the same Means?

Besides, there is by no Means any Reason for believing, that an Instance of this surprising Abstinence and Want of Food, produc'd by such a profound and lethargic Sleep, as that of the Marmotte, is not to be found among the human Species, for in *Miscellan. Academ. Natur. Curios. An.* 8. *Obs.* 67. the celebrated *Ludovicus*, first Physician to the Duke of *Saxe-Gotha* informs us, that a young Girl, who for some Fault she had committed being apprehensive of a severe Chastisement from her Parents, retir'd to the most conceal'd Part of a Thicket, where, seven Days after her Elopement, she was found lying on her Belly with all the apparent Signs of Death, except that her Limbs were still flexible and pliant; her Visage was overspread with a viscid Phlegm, which was cover'd with an hoary Kind of Down, and with the falling Leaves which had adher'd to it. Her Mouth and Nostrils were entirely full of a thick Mucus. But notwithstanding these seemingly discouraging Circumstances, the Physician call'd to her Assistance, order'd her Body to be warm'd by Means of Friction; Then, with warm Water,

washing

washing away the Phlegm which cover'd her Face, and the viscid Mucus which obstructed her Mouth and Nostrils, he pour'd into her Mouth a Spoonful of Brandy, which seem'd to go down her Throat, and was the only Cordial he had at hand. Upon exhibiting a second Spoonful, she fetch'd a Sigh, and a third made her open her Eyes.

We now proceed to consider the most proper and efficacious Measure to be taken for the Relief of drown'd Persons; for which Purpose we shall previously investigate and ascertain the genuine Cause of Suffocation.

Not only the antient Schools of *Greece* and *Arabia*, but also most of the succeeding Physicians, till the Days of *Platerus*, imagin'd that the Suffocation was produc'd by the Water which enter'd into the Stomach, Breast, and Lungs; in Consequence of which false Notion they thought themselves fully authoriz'd to attempt its Discharge with all possible Expedition. For this Purpose they order'd drown'd Persons to be suspended by the Feet, or laid upon their Bellies, on a Hogshead or Tub, which was to be agitated from one Side to the other, imagining that by this Position, the Abdomen and Breast being compress'd, and the Head hanging down, the Agitation of the Vessel must necessarily facilitate the Evacuation of the Water, which they suppos'd was also favour'd by the declining Situation of the superior Part of the Body. With the same Intention, they also order'd such Measures as had a Tendency to excite Vomiting.

But as a false Theory never fails to lay a Foundation for a dangerous Practice, so we have just Reason to condemn this Method of Suspention, or hanging by the Heels; for the Water swallow'd by drowning Persons descends into the Stomach, and

and not into the Thorax, so that it cannot prevent their Recovery. This Circumstance must happen, not only so long as a Person retains a Sense of his State and Condition, but also afterwards; for as the Water is hinder'd from entering into the Arteria Trachæa and Lungs by a mechanical Effort, in which Reason has no share, for the Lungs may in this State be compar'd to an empty Bottle plung'd in Water, into which the Fluid does not enter, because the Air it contains resists its Access, and this the rather happens, because the Motion of the Breast, destin'd to attract the Air, at that Time, totally ceases, and consequently nothing forces the Water to enter and fill up its Place. This Doctrine is not only evinc'd from the Structure of the Parts, but also confirm'd by Experience.

Thus the learned *Platerus*, in *Quæst.* 5. positively affirms, that if drown'd Persons swallow any Water, the Quantity of it is too small to prove mortal to them; because he always found but very little of it in their Stomachs. He also adds, that most of the Water which appears to be discharg'd from the Mouths of Persons suspended by the Heels, really flow'd from their Cloaths.

Nymman, in *Tr. de Vita fœt. in Utero*, speaks thus, "Who could believe that a Fœtus so long "included in the Uterus, where it moves all its "Limbs, should yet never move its Jaw-bone, "nor open its Mouth. Besides, it always has its "Nostrils open, notwithstanding which it has ne"ver been observ'd that the Liquor of the Am"nios has enter'd its Body. Thus it is with the "Human Fœtus, as with those who are drown'd, "since in dissecting many of these last, I have "hardly found a Pint of Water in their Bodies."

In the *Miscellan. Nat. Curios. An.* 2. *Obs.* 231. *Wepfer*, gives an Account of the Anatomy of some

some Beavers, one of which was drown'd. The Author having open'd the *Arteria Trachea*, no Water was discharg'd from the Lungs; but there were about four Ounces of Water, like the Washings of Flesh, found in the right Cavity of the Breast, and about three Ounces of the same Kind in the Left. This Extravasation the Author justly supposes produc'd by the Expression of a bloody Lymph from the Pores of the Bronchia of this Animal, which had for a long Time struggled against so violent a Death as that of Drowning. Neither pure Water nor Water ting'd with Blood were observ'd either in the *Arteria Trachea*, or in the *Bronchia*.

Bhonius, in the Appendix to his Treatise *de Renuntiat. Vuln. Diff.* 20 informs us, that in dissecting a great many Women drown'd for murdering their Children, he had shewn the Spectators, that there was little or no Water in their Lungs and Abdomen; and adds, that in order to render himself more certain with Respect to this Circumstance, he had drown'd several Animals, in whose Cavities, tho' drown'd alive, he had never perceiv'd any Water.

Bartholinus, at present Professor of Medicine in *Copenhagen*, in a Letter wrote when he was Professor at *Rostock*, in 1714, gives us an Account of the Dissection of a Soldier, who attempting to make his Escape from a Garrison, was drown'd in a Ditch, and upon being open'd had in his Stomach only about a Pint of Beer, which he had drank some Time before. The Professor took care previously to apprise the Spectators, that there would not be a single Drop of Water in his Breast, which as well as his Abdomen, was very much elevated; and the Event verified the Prediction.

Johannes

Johannes Conradus Becker, in his Treatise *de Submers. Mort. Sin. Pat. Aq.* gives us the four following Histories. A Dog, says he, being drown'd and lying in the Water for an Hour, his Abdomen, Stomach, and Intestines, appear'd tumified and inflated, tho' a single Drop of Water was not found in them. The Lungs were, also, inflated, without containing Water, like those of hang'd Persons, but immediately collaps'd upon suffering the Air to escape thro' an Incision made in the *Arteria Trachæa*. The Author subjoins, that this Observation render'd the Doctrine of the Antients highly suspected by him.

The second, is the History of a Peasant, taken from the Water, after he had been some Weeks in it, and was entirely putrified. After opening his Duodenum, two Ligatures were made on that Intestine, which was very much inflated, and from the Aperture of which nothing was discharg'd, but a Liquor which was Chyle mix'd with Beer, of which the Peasant had, at a Market, drank so liberally, as to intoxicate himself. The Tumefaction of the Stomach, laid a Foundation for suspecting that it contain'd a large Quantity of Water, tho' upon laying it open, nothing was found but a Pint of a Liquor, whose Smell exactly resembled that of Beer. The Lungs were so much inflated, that when an Incision was made in the Breast, they burst out; but their Inflation was speedily dissipated, by making an Aperture in the *Arteria Trachea*, thro' which the Air was discharg'd with a considerable Noise. In cutting the Lungs into Pieces, no extraordinary Signs of Humidity were perceiv'd, nor were any preternatural Circumstances observ'd, except Spots of different Colours.

The third History, is that of a Woman drown'd in a Well, in whose Intestines nothing but Chyle

was

was discover'd, neither was there any Water in the Lungs. The Intestines collaps'd upon making a small Puncture in them, and an Aperture being made in the Arteria Trachea, the Air escap'd thro' it from the Lungs with some Noise.

The fourth and last History related by *Becker*, is that of a Man who was found standing upright in a Bason, where he had remain'd under Water for five Days. His Stomach, which was large, was only inflated with Wind, and hardly contain'd six Ounces of a whitish Liquor. The Lungs being equally inflated, collaps'd upon cutting the Arteria Trachea, from which the Air was discharg'd with a considerable Noise. When he was found, two Spoonfuls of Water were not discharg'd from his Mouth. "He was, however, continues *Becker*, "every where surrounded with Water, but "that Element, notwithstanding the Minuteness "of its Parts, could not penetrate into the Arte-"ria Trachea and Oesophagus, in order to fill the "Cavities of the Viscera; an evident Proof that "these Parts were so defended against every Thing "that made an Attempt to enter them, that the "Water itself could not force a Passage into "them."

From these Observations, the celebrated Author concludes, that the Absence of Water in the Lungs and Intestines, is not a Proof that a Person has been thrown into the Water after his Death. This Observation is of the last Importance to those whose Business it is to make Reports before Courts of Judicature, tho' it is contrary to that of *Roderican à Castro*, adopted by many Philologists and Criminalists, and among others by *Feltman* in *Tr. de Cadavere inspiciendo*, Cap. 21. But as in the Opinion of *Becker*, the Lungs are not inflated in those who are thrown into the Water after Death, so we may

from their Inflation draw a Proof, that the Perſon was alive when drown'd, or put into the Water.

Since, therefore, it is ſufficiently obvious, both from the Structure of the Parts, and the Authorities of the moſt penetrating Anatomiſts, that little or no Water enters the Bodies of drown'd Perſons, ſo 'tis equally obvious, that the Practice of hanging by the Heels, is not only uſeleſs, but muſt alſo contribute to deſtroy thoſe Remains of Life which may poſſibly be loſt; for by ſuch a Suſpenſion, the whole Column of the Blood convey'd to the Heart by the inferior *Vena Cava*, will neceſſarily preſs upon that convey'd by the ſuperior *Vena Cava*, where the Blood being interrupted in its Courſe, muſt neceſſarily regurgitate into the jugular Veins, and conſequently into the Head, where, by its Quantity and Weight, it retards the Motion of the Spirits, whoſe free Progreſs is abſolutely neceſſary to reſtore the Circulation of the Blood, on which Life in a great Meaſure depends.

As it is of great Importance, to know the Cauſe of the Inflation of drown'd Perſons, ſince it is not produc'd by the Water they ſwallow, ſo the learned *Dethardingius* accounts for it in the following manner, "Thoſe, ſays he, who die in the Water, "are not deſtroy'd for Want of Air, but by "means of too large a Quantity of it; they do "not die in Expiration, but in Inſpiration; and "in a Word, nothing more reſembles each In-"ſpiration, than the Phænomena obſerv'd in "drown'd Perſons; for if we attentively conſider "what happens to ourſelves, we perceive that the "Breaſt is as it were lengthen'd, the Abdomen "elevated, and the Flanks inflated, and that this "State ſubſiſts, ſo long as we draw in the Air, or "retain it in the Breaſt. Now the ſame Things "happen in drown'd Perſons, only with this Dif-"ference,

" ference, that in the latter, the Inſpiration is
" perform'd with Rapidity and Violence, whereas
" in the former it is carried on quietly and without
" any Effort. In Perſons not drown'd, a Depreſ-
" ſion ſucceeds the Elevation; but in drown'd
" Perſons the Elevation of the Abdomen, and the
" Elongation of the Breaſt ſubſiſt; by which means,
" all the Parts continue in a State of Expanſion.
" This is, no doubt, the Meaning of thoſe, who
" look upon the Death of drown'd Perſons as a
" Suffocation, and pretend that the Cauſe of it,
" and that of ſtrangled Perſons is the ſame; for
" thoſe two Kinds of Death have a great Reſem-
" blance and Analogy, as is ſufficiently obvious
" from the Elevation of the Abdomen, which in
" hang'd Perſons ſubſiſts after their Death."

From this Theory 'tis ſufficiently eaſy to conceive, that the Inflation of the Lungs, is the Cauſe of the Death of drown'd Perſons; accordingly *Derhardingius* from the preceding Doctrine draws the following Concluſions; " The Veſicules of
" the Lungs are inflated by the Air, the Bronchia
" are lengthen'd, the Blood Veſſels diſtributed
" thro' the whole Body of the Lungs, are com-
" preſs'd; and tho' the Elongation of the Bron-
" chia aſſiſts the Entry of the Blood into the large
" Veſſels, as well thoſe proper to the Lungs, as
" the bronchial Artery and Vein, as thoſe which
" are only ſubſervient to the Circulation, as the
" pulmonary Artery and Vein, yet the Circulation
" is not carried on equally in the Capillaries; ſince
" the Preſence of a rarified Air in the Veſicules
" compreſſes the Blood, and forcing it to ſtop
" there, hinders it from paſſing into the Left Ven-
" tricle of the Heart, in order to accompliſh the
" Circulation. Now as ſoon as there is a conſi-
" derable Retardation in this important Function,

" the vital Motions alſo gradually ceaſe, and " Death approaches inſenſibly."

After having thus diſcover'd the Reaſon of the Inflation of the Lungs, and of the Death which ſucceeds that Circumſtance, we ſhall, with the ſame Author, inveſtigate the Cauſe which hinders the Diſcharge of the Air from the Lungs and Breaſt. This is by no means a Topic of pure Curioſity, ſince, the Aſſiſtance to be afforded to drown'd Perſons, can be of no Service, except in ſo far as it is proper to remove thoſe Obſtacles, which oppoſe and hinder the reſpective Actions of the vital Functions. Now *Bethardingius* and *Becker* pretend, that the *Epiglottis*, (which is a ſmall Valve plac'd at the external Entrance of the Larynx, in order by its covering the Glottis, to hinder all ſolid or liquid Bodies which may be put into the Mouth, from deſcending into the Canal of Reſpiration) being exactly and ſtrongly applied over the Glottis, proves the Obſtacle to the Diſcharge of the Air from the Lungs. Theſe Authors, alſo, affirm that ſuch a ſtrong and convulſive Application of the Epiglottis over the Glottis, ariſes from a preternatural Extenſion of the Fibres of thoſe Membranes of the Larinx, which cover the Epiglottis. This preternatural Extenſion they attribute to the violent Inſpiration excited by Fear, in Perſons who run a Riſk of being drown'd. Thus the incomparable *Bethardingius* reaſons in the following Manner: " If in all Kinds of Dread and Terror " we obſerve, that Reſpiration is diſorder'd; that " is to ſay, that Inſpiration is more quick, and laſts " longer; and that, on the contrary, Expiration " is intercepted, uncertain, and ſhort, it follows " of Courſe, that Inſpiration muſt be much more " ſtrong, and the Air attracted in a far larger " Quantity, when a Perſon perceives that he is

" threat-

" threatn'd with Death by the Water, which muſt " in a Moment fill the Space which ought to be " occupied by the Air."

It is pretty ſurpriſing that *Becker* and *Dethardingius* ſhould only reaſon conjecturally in this Affair; ſince the Diſſections they made of drown'd Perſons, might have enabled them by their Eyes to judge of the Diſpoſition of the *Epiglottis* in theſe unfortunate Creatures. But, be this as it will; certain it is that *Dethardingius*'s Method of affording Relief to drown'd Perſons, is highly rational, and promiſes fair for reſtoring them to Life. It conſiſts in four Things; the firſt of which is, to place the Body drawn from the Water in a proper Poſture and Situation. The Second is to compreſs the Abdomen, at the ſame Time that Frictions are making on the Back. The Third is, to excite an Irritation in the Throat; and the Fourth to make an Inciſion in the *Arteria Trachea*.

As for the Situation of the Perſon taken from the Water, we have already ſhewn Suſpenſion by the Heels to be prejudicial; tho' *Becker* recommends it, becauſe he thinks the Weight of the abdominal Viſcera may thruſt the Diaphragm into the Breaſt, compreſs the Lungs, and giving a greater Spring to the Air, make it act with ſuch an Effort, as to raiſe the *Epiglottis*: But the judicious *Dethardingius*, ſenſible that this Method is ſufficient to deſtroy Reſpiration in Perſons alive, abſolutely condemns it, and orders drown'd People to be laid with their Bodies ſo declining, as that the Head may be loweſt. Beſides, as he had obſerv'd that Reſpiration is more difficultly perform'd on the Belly, he directs drown'd Perſons to be laid on their Backs, and a ſtrong Compreſſion of the Abdomen to be made, from the Region of the Pubes, as far up as

the

the Stomach. He adds, that it is expedient, both for the Sake of the Frictions and the Compreſſion, to rub the Hands with ſome Oil, proper to reſtore to the Fibres render'd rigid by the Cold and Spaſms, that Suppleneſs and pliant State, which is neceſſary to them in order to perform the Motions of Reſpiration.

Pechlinus obſerves, that in *Sweden* it is cuſtomary to uſe Frictions on Perſons taken out of the Water, and externally to apply hot and ſpirituous Remedies in order to reanimate the internal Heat, and more effectually excite the Effervescence of the Blood. *Borelli*, in *Hiſt. Cent.* 2. *Obſ.* 11. orders the Skin to be render'd red by Means of Frictions in a warm Bed. Mr. *Joly*, a Phyſician of *Britany*, in the Obſervations inſerted in the Hiſtorical Journal, for the Month of *November* 1743, adviſes Frictions before a large Fire with hot Cloths, with a View to reſtore the Perſon to Heat as ſoon as poſſible. *Dethardingius* orders theſe Frictions to be made from the Nape of the Neck down to the Buttocks, becauſe, the Heads of the Muſcles ſubſervient to Expiration, are attach'd to the Spine of the Back, and their Tendors to the Ribs; and becauſe, in his Opinion, Friction facilitates the Action of theſe Muſcles, eſpecially when made with Oils, which contribute to reſtore the Plyancy of the Fibres.

Beſides Frictions before a Fire, with hot Cloths ſoak'd in Oils or ſpirituous Liquors, are beneficial in another Reſpect, becauſe, the Spine of the Back is the Origin of a great Number of Nerves and conſequently of the various Motions perform'd in the Body. This cannot fail to put all the vital Springs in Action; by reſtoring Suppleneſs to the nervous and muſcular Fibres, and Motion to the

ſlow circulating, or even totally coagulated Juices. This is the Reaſon, why Frictions and Pumping ſo often prove ſucceſsful in Apoplexies.

We muſt, alſo, obſerve, that *Detbardingius*, approves of laying drown'd Perſons on their Bellies over a Hogſhead, or round Veſſel, which is to be agitated, not with a View to make them diſcharge the Water they have ſwallow'd, but to ſhake and compreſs the Abdomen, and thruſt its Contents towards the Diaphragm. But *Foreſtus*, in *Obſervat. Chirurg.* Lib. 6. *Obſ.* 33. & *Obſ. Med.* Lib. 13. *Obſ.* 26. condemns this Expedient as well as that of Hanging by the Heels, "because, ſays "he, it has produced ſudden Death in ſome Per-"ſons who could not bear the violent Motion, "the Turning, the internal Parts of the Body "topſy-turvy, and the Agitation of the Head, "and Vomiting produc'd by this Means." Mr. *Foly* alſo condemns the putting drown'd Perſons in a Hogſhead open at both Ends in order to be roll'd for ſome Time in different Directions.

Detbardingius ſeems not to have laid great Streſs upon the *Swediſh* Practice of defending the Bodies of drown'd Perſons from the Contact of the Air, and of conveying them into warm Places. The firſt Step however taken by the *Swedes* is, according to *Pechlinus*, to wrap ſuch Bodies up in warm Cloths. *Langelotti* alſo, in *Miſcel. Nat. Curioſ. An.* 6. *Obſ.* 20. informs us, that this Method is among them univerſally put in Practice, becauſe they have learn'd from long Experience, that no drown'd Perſon recovers, if he is left long expos'd to the free Air. Mr. *Foly* is, alſo, of Opinion, that drown'd Perſons ſhould be left upon the Shore no longer, than is neceſſary to pull off their Cloths, which may be cut off for the Sake of Expedition; "for, continues he, a ſingle Moment

"often

" often determines between a State of Death or " Life. In conſequence of this Principle, he adopts the *Swediſh* Practice; " for, *ſays he*, when " the drown'd Perſon's Cloths are taken off, he is " to be wrapt up in the warmeſt Coverings or " Cloths which can be then had. Then he is to " be convey'd to the neareſt Houſe, where after " Frictions before a warm Fire with hot Cloths, " he is to be laid in a very warm Bed. Great " Care is to be taken, to apply to his Feet, the " Inner-ſides of his Thighs, his Houghs, and his " Arm-Pits, Flaggons full of boiling Water, " wrapt up in linen Cloths." For the ſame Purpoſe we may make uſe of Bricks. I muſt, however, obſerve, that Mr. *Joly* recedes from the *Swediſh* Practice, in a Circumſtance which to me appears to be of the leaſt Importance; for the *Swedes* do not warm the Bodies of drown'd Perſons ſuddenly, but by little and little, before a gentle Fire. The Expedience of this may be convinc'd by conſidering the Effects of a too intenſe Heat upon Fiſhes found frozen in the Winter Time, which indeed recover for a Moment, and then die irretriveably. *Nymman* and *Ranchin* alſo order'd drown'd Perſons to be laid in warm Places, eſpecially in Winter.

As in drown'd Perſons, a Defect of reſpirable Air produces a Suffocation, ſo it would be no leſs fooliſh, than barbarous, ſuddenly to expoſe them to the entire Action of the Atmoſphere, ſince that Fluid entering precipitately into the Thorax, would produce, in the pulmonary Veſſels, a Dilatation, which inſtead of promoting the Paſſage of the Blood thro' that Organ, would produce a freſh Obſtruction in it, becauſe the Action of the Heart is not ſtrong enough, to ſurmount the Reſiſtance which the Air makes to the Paſſage of the

Blood;

Blood; and this muſt the more inevitably happen, becauſe the Lungs in ſuch a State collapſe, which is the unavoidable Fate of all Fibres deprived of the Influx of the Animal Spirits, which neceſſarily depends on the free Conveyance of the Blood thro' the whole Body, and the Velocity of its circular Motion. The Precaution, therefore, of wrapping Perſons taken from the Water in Blankets, is highly proper, and excellently ſuited not only to this Species of Suffocation, but alſo of all others.

But it is not ſufficient to guard drown'd Perſons againſt the rude Impreſſions of the Atmoſphere, ſince 'tis alſo requiſite they ſhould only be permitted the free Uſe of that Fluid by Degrees.

As the Decreaſe of the Circulation is neceſſarily ſucceeded by a proportionable Diminution of Heat, ſo 'tis juſtly to be expected, that the Bodies of drown'd Perſons have loſt the greateſt Part of that Warmth, which is ſo neceſſary to the Support of Life. Hence 'tis abſolutely requiſite they ſhould be warm'd. But it would be equally pernicious, ſuddenly to expoſe them at once to the Fire, or precipitately to exhibit Medicines, which by the Volatility of their Principles, might produce a Rarefaction of the Blood. 'Tis, therefore, far more ſafe and prudent, to begin with gradually augmented Frictions of the Extremities with warm Cloths, than all at once to expoſe ſuch Perſons to the Fire, or call in the Aſſiſtance of hot and volatile Medicines, both of which may be ſafely, tho' ſparingly and gradually us'd, when the Circulation is ſo reſtor'd, that their bad Effects are no longer to be fear'd.

These Precautions are founded on phyſical Reaſons, which tho' ſufficiently known to Phyſicians,

may yet afford freſh Pleaſure and Entertainment to Readers of another Claſs.

The Blood, then, of the *Vena Cava*, diſcharges itſelf into the right Auricle of the Heart, whoſe Contraction forces it into the right Ventricle, which in its Turn contracting itſelf, propels the Blood into the Pulmonary Artery. That thoſe Operations may be perform'd, 'tis neceſſary the Quantity of Blood diſcharg'd into the right Auricle, ſhould not over-power its Action; that the contractile Force of the right Ventricle ſhould be ſufficient to propel the Blood in the pulmonary Artery; and that in this Artery there ſhould be nothing to obſtruct or oppoſe the Diſtribution of the Blood, which ought to be made in it. Now according to this Theory, the Contractions of the right Auricle and Ventricle, are in ſuch Caſes extremely weakened, ſince theſe Muſcles partake of the Relaxation of the whole Syſtem of the Fibres. The Lungs, alſo, collapſe, and conſequently oppoſe the free Circulation of the Blood, or its free Diſtribution thro' themſelves. If, therefore, in affording Aſſiſtance to drown'd Perſons, we ſhould precipitately convey too quick a Motion to the Blood, we ſhould by that very Circumſtance produce invincible Obſtacles to its Circulation, and conſequently make the Means of recalling Life ſubſervient to the Production of irretreivable Death; for the exceſſive Quantity of Blood which enters the right Auricle, will over-power and ſurmount the weak Force which reſiſts it. Beſides, tho' this Auricle had contractile Force enough to convey the Blood into the Heart, yet the Action of that Muſcle will not be ſufficient to propel the Blood into the Lungs, or at leaſt to ſurmount the joint Reſiſtance made by the collapſed State of the Lungs, and the Air compreſſing their Blood-Veſſels.

Veſſels. Theſe Methods, therefore, of relieving drown'd Perſons and reſtoring them to Life, are not only founded upon the animal Oeconomy, but are alſo abſolutely neceſſary and indiſpenſible.

'Tis, however, to be obſerv'd, that when the Circulation begins to be carried on freely, we may, if ſuch Practice is indicated by any preſſing Circumſtances, attempt to reduce it to its natural State, by means of Cordials and anti-apoplectic Medicines; tho' theſe, eſpecially the latter, as being moſt powerful, are in the Beginning to be us'd with the utmoſt Caution; and probably the ſafeſt Method is totally to abſtain from the anti-apoplectic Medicines, and to begin with the mildeſt Cordials, whoſe moſt energetic Parts being diluted in a large Quantity of ſome proper Vehicle, may more inſenſibly mix themſelves with the Maſs of Blood, and conſequently produce their Effects more ſlowly. 'Tis, however, to be obſerv'd, that the ſame Danger is not to be dreaded from the external Uſe of the moſt efficacious Remedies. Thus, for Inſtance, we need not heſitate to apply Topics to the Temples, the Noſtrils, the Wriſts, the Pit of the Stomach, and all thoſe Parts, where the Arteries lying near the Surface of the Body, are expos'd to their Action and Influence. And as the Membranous Parts are none of the leaſt conſiderable Inſtruments of the ſeveral Motions perform'd in the Body, ſo a very particular Regard ought to be had to them: Frictions, then, of the Hands and Feet, as well as the Application of ſpirituous Medicines to theſe Parts, are extremely beneficial; for tho' the Propriety of this Practice could not be demonſtrated from Anatomy and Phyſiology, yet we might be fully convinc'd of it, by the Obſervation of *Deventer*, who orders Frictions with Bruſhes to be made on the Soles of the Feet of

ſuch new-born Children, as diſcover no Signs of Life, in order to reſtore the Circulation of the Blood, which is the Foundation or firſt Beginning of it.

Deventer does not, indeed, adviſe the Application of ſpirituous Medicines to theſe Parts; but as 'tis ſufficiently certain, that theſe, as well as all other Liquors, penetrate the Surface of the Body, and enter the Cavities of the Veſſels, ſo their external Applications muſt neceſſarily produce very happy Effects. Beſides, this Method of uſing ſpirituous Medicines, is of all others the ſafeſt; not only becauſe their Mixture with the Blood is not ſo quick as when they are exhibited internally, but alſo, becauſe, the Parts to which they are applied are moſt remote from the Center.

But we now proceed to conſider the other Methods of affording Relief to drown'd Perſons, beginning with the Smoke of Tobacco, the happy Effects of which are prov'd by various Obſervations. Thus Doctor *Mead* in his mechanical Account of Poiſons, after mentioning that many who have been drown'd and dead to all Appearance, have been ſurpriſingly reſtor'd to Life, ſpeaks in the following manner, from the Memoirs of the Royal Academy of Sciences: "This Circumſtance ſhould "certainly encourage the Uſe of all Means, upon "ſuch Accidents, eſpecially as the Trial is not difficult. The firſt Step ſhould be to blow the Smoke "of Tobacco up into the Inteſtines, then to warm "the Body by ſhaking and rolling about, and rubbing it with warm Cloths in a Bed. In a Word "to put the Blood into Motion all manner of "Ways, and not to be diſcourag'd tho' no Signs "of Life ſhould be diſcover'd after an Hour or "two ſhould be ſpent in this good Work; towards "the latter End of which, Spirits and volatile "Salts may produce a good Effect. Neither

"ſhould

" ſhould bleeding be omitted when the Blood is
" become ſufficiently warm to drop out of the
" Veins."

The happy Effects of the Smoke of Tobacco in reſtoring drown'd Perſons to Life, are farther evinc'd from the following Narration of Dr. *Bruhier*. Mr. *Thomas* a profeſs'd Surgeon of *Paris*, being at *Paſſy*, waited in a Boat till the Number it was to take in ſhould be completed. During this Time, he ſaw a Boat croſſing the River, and when it arriv'd at Land, one of the Paſſengers ſtepping aſhore, and miſſing his Wife, aſk'd what was become of her; but no one could give him any Anſwer, except a young Child, who pointing to the River, ſaid, ſhe had hid herſelf in it. This Woman had fallen from the Stern of the Boat, without being perceiv'd by any of the Paſſengers, except the Child, who gave Directions to row to the very Part where the Woman fell from the Boat. The Huſband finding her in a Place which was not very deep, but full of Mud, brought her to Land, and laid her out. Whilſt ſome of the Spectators of this melancholy Accident were adviſing to hang her by the Heels, and others ordering different Meaſures to be taken, a Soldier with his Pipe in his Mouth, came to aſk the Reaſon of ſuch a Concourſe of People; upon being inform'd of the Accident, he deſir'd the diſconſolate Huſband to give over weeping, becauſe his Wife would return to Life very ſoon. Then giving his Pipe to the Huſband, he bid him introduce the ſmall End of it into the Anus, put a Piece of Paper perforated with a large Number of Holes upon its Mouth, and thro' that blow the Smoke of the Tobacco into her Inteſtines, as ſtrongly as he poſſibly could. Accordingly at the fifth Blaſt, a conſiderable rumbling in the Woman's Abdomen was heard, upon which

which ſhe diſcharg'd ſome Water from her Mouth and in a Moment after return'd to Life. This Practice, however inſignificant in the Eyes of the Vulgar, is nevertheleſs of the higheſt Importance; for the Irritation of the Inteſtines, excited by the Heat and Acrimony of the Smoke of the Tobacco, produces in the Muſcles ſubſervient to Expiration, ſuch a Reflux of the animal Spirits, as induces a Contraction of them ſufficient to ſurmount that Reſiſtance which the Air contain'd in the Breaſt, found to its Diſcharge. This happy Effect of the Smoke of Tobacco is ſufficiently evinc'd by the preceding Hiſtory, ſince it made the Woman vomit up the Water ſhe had ſwallow'd. Now vomiting is excited by a ſtimulating Contraction of the Diaphragm, and of the tranſverſe Muſcle of the Abdomen, which contracting the Stomach, force it to diſcharge its Contents, where the leaſt Reſiſtance is found, and conſequently by its ſuperior Orifice. It is to be obſerv'd, that the ſame happy Effects are produc'd by the Smoke of all acrid Subſtances, ſince Mr. *Foly* affirms, that the ſame End is equally anſwer'd by the Smoke of Sage, and other Plants of a ſimilar Nature. It is alſo highly probable, that Clyſters prepar'd with Coloquintida or Tobacco, would produce Effects equally good; but on ſuch Occaſions, the moſt ready and expeditious Meaſures are always to be taken, ſince a very ſmall Delay may prove of the laſt Conſequence, by deſtroying a Life which might otherwiſe be preſerv'd.

In Caſes of Emergence, where proper Inſtruments are not immediately to be procur'd, the Preſcription of the Soldier in the preceding Hiſtory, may be follow'd; but it may loſe leſs Time to cover the Tobacco in the Bole of the Pipe, when lighted, with a ſilk Handkerchief, either ſingle, or

or once doubled, than to wait till proper Holes are bor'd in a Piece of Paper, tho' this takes up very little Time. However, that no neceſſary Inſtructions might be wanted, I have given the Figure of an Inſtrument, contriv'd on purpoſe for impelling the Smoke of Tobacco into the Inteſtines. A. repreſents a Braſs or Iron Box, capable of containing half an Ounce of the ſtrongeſt Tobacco, which is to be lighted. B. is a common Clyſter Pipe, to be introduc'd into the *Anus*, join'd to the flexible Tube D. D. made of Leather. C. is another Pipe, at which a Perſon blows forcibly, that the Smoke of the Tobacco in the Box A. may be impell'd thro' the flexible Tube D. D. and the Pipe B. into the Inteſtines. E. repreſents the Smoke. If one Clyſter is not ſufficient, another ſhould be given ſoon after, and repeated till it anſwers.

Theſe Clyſters of the Fume of Tobacco, are of excellent Uſe in the Iliac Paſſion, and in an incarcerated Hernia; and no Apothecary or Surgeon ought to be without ſuch an Inſtrument.

As the olfactory Nerves are of all others the moſt expos'd to the Action of Bodies, and have an intimate Connection with thoſe ſubſervient to the Motion of the Muſcles deſtin'd for Reſpiration, it muſt of courſe be beneficial to irritate the Nerves of the Noſe; ſo that what we call Sternutatories, or ſuch Subſtances as excite Sneezing, produce happy Effects in reſtoring drown'd Perſons to Life: *Indian* Marum or Euphorbium introduc'd into the Noſe, or reduc'd into a Powder and blown up the Noſtrils, will in all Probability produce ſalutary Effects, ſince if they operate they will excite a violent Expiration, ſufficient to remove all thoſe Obſtacles which the Air finds to its free Diſcharge. Mr. *Joly* warmly recommends this Practice, as alſo Injections of ſpirituous Liquors. Thus the

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Injection of Spirit of Sal Ammoniac into the Noſtrils, operates more powerfully than holding volatile Sal Ammoniac to them. Perhaps Vinegar will ſtimulate yet more ſtrongly, and with better Effect.

All thoſe Authors who treat of the Meaſures proper for reſtoring drown'd Perſons to Life, order a Vomiting to be excited, in order to procure a Diſcharge of the Water contain'd in the Stomach. This is the Doctrine of *Codronchus*, *Foreſtus*, *Camerarius*, and Mr. *Joly*, who imagines that the Water in the Stomach of drown'd Perſons, is one of the Cauſes of their Death. In order to excite this Vomiting, they order the Throat to be tickled with the bearded End of a Quill. *Becker* and *Dethardingius* order a Feather to be introduc'd into the Oeſophagus, in order to excite ſuch a Motion of the Epiglottis, as is ſufficient to procure a Diſcharge of the Air contain'd in the Breaſt. Now 'tis ſufficiently known to every Body, that the bearded End of a Quill excites Vomiting. We muſt here obſerve, that Mr. *Joly* only orders Vomiting to be procur'd after drown'd Perſons return to Life. But it is certain, that vomiting can produce no happy Effects, if there is nothing in the Stomach, or only a Quantity of Water equal to that daily us'd by moſt People. As for liquid Emetics, their Effects appear to be highly dubious, ſince the Oeſophagus may poſſibly be in ſuch a convulſive State, as to hinder Deglutition. *Dethardingius* looks upon this Irritation of the Throat, as a Circumſtance of the higheſt Importance; but for exciting it, prefers a certain Inſtrument invented in *Germany*, and deſcrib'd by *Heiſter* in his Surgery.

According to *Pechlinus*, the *Swedes*, attempt to reſtore the Lives of drown'd Perſons, by Means of

of Fomentations, with anti-apoplectic Medicines; that is, such as are of an hot and spirituous Nature. *Borelli* in *Obs.* 11. *Cent.* 2. informs us, that he successfully us'd toasted Bread soak'd in warm Brandy, applied to the Region of the Heart, and frequently renew'd. *Nymman* in *Tr. de Apoplexia. Cap.* 44. orders us to apply to the Nostrils of drown'd Persons, odoriferous Substances, and such as are capable of putting the Spirits in Motion, and restoring the Action of the Heart, and the Functions of the Brain. Of this Kind are Penny-royal Rue; and Lilly of the Valley, soak'd in Vinegar. He, also, orders us to apply to the Region of the Heart, Epithems prepar'd of Baum, Rue, Marjoram, Amber, Cinnamon, and Lavender. Thus for Instance;

Take of the best Rose-Water an Ounce and an half; of Baum-Water two Ounces and an half; of Rosemary-Water one Ounce; of Malmsey Wine one Ounce and an half; of Lemon Juice one Ounce, of the Powder of Cloves one Scruple; of Theriaca one Dram, and of Camphire and Saffron each half a Dram. Mix all together, and in the Liquor soak a Spunge, to be applied to the Region of the Heart.

As the genital Parts of both Sexes have a near and intimate Correspondence with the Heart, as is obvious from the Effects of Cordials, applied to those Parts, in Syncopes, Faintings, and other Affections of the Heart, so *Nymman*, in order to restore drowned Persons to Life, orders these Parts to be fomented with warm Wine, in which Cinnamon, Cloves, Musk, and Baum have been boiled.

But if any Success is to be expected from these Remedies, it is principally, when by the Assistance of Frictions, the most volatile Parts of Spirituous Liquors are made to penetrate into the Mass of

Fluids; and it is highly probable, that independently of the Experience of the *Swedes*, this Method will answer the End proposed by *Dubardieu*, which is, the procuring of a free Expiration; for, if the Admixture of the spirituous Parts of cordial Liquors restores the Course of the Spirits and Blood, it must necessarily follow, that both must be more copiously conveyed to the Muscles destin'd for the Purposes of Expiration.

It is also certain, from Experience, that one of the most efficacious Expedients for restoring drown'd Persons to Life, is speedy Venesection, especially in those Parts, most proper for relieving the Head, as the Ankles, for Instance, and the Jugular Veins. The Use of Venesection, in such Cases, must be sufficiently obvious to every one who considers, that drowned Persons, as well as those who are hang'd, die of an Apoplexy of the sanguineous Kind, and not for Want of Respiration, or, as is commonly imagined, on Account of a Repletion, or choaking up of the Breast by Blood; for when such Persons are laid open, the Breast is found almost entirely void of Blood, and the Brain extremely inflamed; both which Phænomena are highly agreeable to the Laws of the Circulation.

These are the most common and approved Methods of restoring drown'd Persons to Life; but, if they should happen to prove ineffectual, the last Resource is, what we commonly call *Bronchotomy*, or *Tracheotomy*, which consists in opening the *Trachea*, in order to procure a free Access of the Air to the Lungs. This Operation is principally intended to remove the obstinate Adherence of the Epiglottis to the Orifice of the Glottis; in consequence of which Circumstance, the Air contained in the Lungs is freely discharged. Tracheotomy was indeed originally intended for the Extraction of foreign Bodies from the *Trachea*, or

for the procuring an Acceſs of the Air to the Lungs when the Inflammation of the Muſcles of the *Larynx*, is ſo conſiderable in Quinſeys, as to cloſe up the Aperture of the *Glottis*.

Tracheotomy, according to *Dethardingius*, has all the Advantages which can be wiſhed for, ſince it affords Relief *ſpeedily*, *effectually*, and *agreeably*: *Speedily*, becauſe there is no more expeditious Method of procuring a Diſcharge of the Air, which, by its natural Spring, and by the continual Compreſſion of the Abdomen, muſt neceſſarily be evacuated in that Manner. Now the Air cannot eſcape from the Pulmonary Veſicles, without their collapſing and expreſſing into the Pulmonary Vein, the Blood which had entered the Pulmonary Artery, which cannot happen, without adding a greater Facility of Circulation to the arterial Blood. Now the Blood arriving at the left Auricle, and thence at the left Ventricle, produces a new Contraction of the Heart; upon which the Circulation is reeſtabliſhed, and Life diſcovers itſelf by manifeſt Signs, eſpecially by Reſpiration.

Tracheotomy, alſo, affords Relief without Danger, becauſe we are no longer afraid of making an Inciſion in thoſe Cartilages, which the Ancients, in Conſequence of their bony Nature, imagined incapable of Conſolidation. We no longer dread the Hemorrhage, ſince only a few Drops of Blood are diſcharged in opening the Membrane, which unites the Ringlets of the *Arteria Trachea*; and ſince there are not contiguous to the Part, ſuch large Blood Veſſels, as being wounded would produce terrible Effects. There is no Danger of injuring the Voice by means of this Operation, ſince the Operator cannot hurt the Muſcles of the Larynx; and ſince there are no Nerves, the Dilaceration of which ſhould impair or deſtroy the Senſation of the Part.

In a Word, it is no difficult Task to heal up, and conſolidate the Wound, for this is readily effected by means of a Plaiſter, or ſome balſamic Ointment.

Thirdly, *Tracheotomy* affords Relief *agreeably*, for it cannot poſſibly be painful to a drowned Perſon, whoſe Senſes are ſo locked up, as to render him incapable of feeling Pain. Thus the Operation is performed without being intercepted by the Cries, the Groans, and Motions, which Pain would produce.

Paulus Ægineta is the firſt Author extant, who deſcrib'd the Operation of *Broncotomy*, from *Antyllus*. But the judicious and accurate *Heiſter*, in his Surgery, deſcribes this Operation very diſtinctly. The Words *Bronchotomy*, ſays he, *Laryngotomy*, and *Tracheotomy*, are convertible Terms, and mean no more than an Inciſion of the *Aſpera Arteria*, or what we commonly call the *Wind-Pipe*: and indeed various Cauſes and Circumſtances concur, to render this Operation abſolutely neceſſary on ſome Occaſions; for, in the firſt Place, it becomes principally and indiſpenſably ſo, when in a Quinſey, the Fauces are ſo terribly inflamed, that the Patient is in imminent Danger of having his Reſpiration quite ſtopt, and a total Suffocation brought on. *Secondly*, It becomes neceſſary, when a Bean, a Prune, a Cherry-ſtone, a Pea, or any other extraneous Subſtance falls into the *Aſpera Arteria*, and ſeems to threaten a Suffocation. *Thirdly*, The *Aſpera Arteria* is alſo to be opened, in ſuch Perſons, as have been ſuffocated, in Conſequence of their being immers'd in Water, or as we commonly expreſs it, in newly drowned People; for Reſpiration has been often reſtored to Perſons in this Condition, by opening the *Aſpera Arteria*, and by that means procuring a free Acceſs of the Air to the Lungs. I am ſufficiently appriz'd, that a great many forbid making

king an Inciſion in the *Aſpera Arteria*, and conſequently condemn this Operation; becauſe they think it productive of Death, and are therefore prompted by an idle Zeal, to brand the Phyſicians, who approve an Operation, ſo dangerous in their Eyes, with the odious Appellations of barbarous and inhuman. But the Gentlemen, who are of this narrow and confined Way of Thinking, are groſsly miſtaken; for in this Operation, the ſmall Inciſion made in the *Aſpera Arteria*, is ſo far from killing the Patient, that it does not produce that Effect when made conſiderably large; and *Garengeot* gives Examples of various Cures performed by this Operation; ſo that we think ourſelves authoriz'd with *Caſſerius, in Tr. de Vocis, Auditusq; Organis*, to pronounce thoſe Men unskilful, timorous, and even cruel, who in the Caſes now mentioned, fooliſhly neglecting this Operation, which is not only ſafe, but alſo attended with the moſt ſpeedy and ſalutary Effects, ſuffer the Patients to die for Want of this ſeaſonable Aſſiſtance. Inſtances of this Nature may be ſeen in *Nicolai Fontani Obſervat. Ranior. Analect.* and in *Caſſerius*.

When *Bronchotomy* is to be perform'd, that Part of the *Trachea* ſeems moſt proper for making the Aperture in, which is ſituated between its ſecond and third cartilaginous *Annuli*, or Ringlets. The Inciſion, may, however, be made a little lower, without any Danger. The Method of performing the Operation, eſpecially when a foreign Subſtance falling into the Aſpera Arteria, and threatning a Suffocation is to be extracted, is thus. The Patient is firſt of all to be ſituated in a reclining Poſture, either in Bed, or in ſome convenient Chair, and his Head is to be held firm by an Aſſiſtant ſtanding behind his Back. Then a longitudinal Inciſion is to be made, thro' the Skin, Fat, and Muſcles,

from

from about two Fingers Breadth below the *Cartilago Thyroides*, or Scutiformis, or the *Pomum Adami*, in the middle of the *Trachea*, down to the very Sternum, ſo that the Length of the Inciſion may be two, three, and in tall Patients, four Fingers Breadth in Length.

Then an Aſſiſtant is carefully to draw the Lips of this Orifice from each other, either with proper Hooks, or with his Fingers, and having abſorb'd and wip'd away the Blood, either by a Spunge or Linnen Cloth, ſo that the *Aſpera Arteria* may be ſeen, three or four of the Annuli or Ringlets of that ſpiral Pipe, are to be cut in ſuch a Manner, that the Inciſions made in the Whole, may form one continued Line, and thus whatever Subſtance may have ſlipt into it, is to be artfully and cautiouſly extracted, either by a Probe, Hook, or Forceps. This being done, the Wound is to be cleans'd, with a Spunge, and its Lips being kept in Contact by adheſive Plaiſters, a proper Compreſs and Bandage are to be applied. It is afterwards to be carefully agglutinated, by means of vulnerary Balſams, as in other Wounds of the *Aſpera Arteria*. By this very Method, continues *Heiſter*, I myſelf in *Helmſtadt*, happily extracted a Piece of boil'd Muſhroom from a Patient, who happening to laugh while he was ſupping Broth, in which among other Things there were Muſhrooms, had the Misfortune to have a Piece of one of them ſlip into his *Aſpera Arteria*, by which means he was in Danger of being ſuffocated. *Ravius*, continues *Heiſter*, alſo inform'd me, that by this very Method, he happily extracted a Bean from the Throat of a Patient. Some in order to induce a more ſpeedy and ſeemly Cicatrix on the Wound recommend Conglutination by Suture as in the Hare Lip. But 'tis certainly abſurd to follow a Practice attended

with

with ſo much Pain to the Patient, whilſt Methods equally good, and at the ſame Time far milder may be purſu'd.

But in all Caſes where a Suffocation is either dreaded, or actually preſent, *Tracheotomy* is abſolutely neceſſary, and may be perform'd in three different Manners. In the firſt of theſe the Patient is to be plac'd in a Bed or Chair, with his Head reclin'd at the Operator's Diſcretion, and held firm by an Aſſiſtant, as before directed. Then let the Surgeon make an Inciſion in that middle Part of the Throat, and in the ſame Manner as before order'd, till he reaches the *Trachea* itſelf, if he thinks proper; the Skin on both Sides is to be laid hold of by the Aſſiſtant; then it may be rais'd and cut longitudinally. After theſe Meaſures are taken, the Fat and Muſcles lying above the *Trachea* are to be cut. Some would have theſe Muſcles firſt diſengag'd from the *Trachea*, or cautiouſly ſeparated from the others; but there is no Occaſion for all this Labour, ſince they may be cut ſafely and without any Danger. Then the Operator is to cleanſe the Wound with a Spunge wrung out of warm Wine, or warm Spirit of Wine for ſtopping the Blood more effectually. The Aſſiſtant is, in the mean Time to ſeparate and retract the Lips, either by Hooks, or by his Fingers. Then the Surgeon is to puſh his Knife between two of the Annuli of *Trachea*, or he may even puſh it in ſuch a Manner as to cut one of them, ſince by that means a ſilver or leaden Pipe either round or flat, furniſh'd with *Anſæ*, or a Rim, ſo as to prevent its falling into the *Trachea*, may be conveniently inſerted into the Wound. But before the Surgeon withdraws his Knife, ſome proper Probe ought to be inſerted in the Wound, by the Side of the Knife, that by its Aſſiſtance a Pipe may be more commodiouſly and eaſily

put into it. This Pipe is fix'd in the Wound by means of a Ligature pass'd thro' its Annuli or small Holes in the Rim, and carried round the Neck, as also by means of a perforated adhesive Plaister: But great Care is to be taken that the End of the Pipe which is inserted into the Wound be not permitted to touch the posterior Part of the *Aspera Arteria* lest by this means a troublesome Cough should be excited. But that the Lungs may not be injur'd by external Cold, or any Filth falling upon them, it is highly proper, to lay upon the Pipe, a Spunge, often impregnated with warm Wine, and again wrung out, or as *Garengeot* advises, a thin Linnen Cloth, and afterwards a perforated Plaister. These Directions being duly observ'd, Blood is to be taken either from the Veins of the Neck or Feet, those under the Tongue, or those situated in the Neck. When Respiration is totally restor'd, which is most quickly discover'd by stopping up the Pipe with one Finger, the Pipe is to be taken out, and the Wound agglutinated in the Manner above directed. But when the Difficulty of Breathing at the Mouth is considerable, the Pipe is to be left for some Time longer in the Wound, and the other Medicines continued.

Another and more expeditious Method of opening the *Trachea*, is this, a two edged Knife is applied to the abovemention'd Part of the Throat, and cautiously pass'd thro' the Skin, Fat, and Muscles, into the Cavity of the *Trachea* itself, and a Pipe is forthwith inserted into the Wound, and carefully secur'd in the Manner before directed. This Manner of Operation is not only quicker, but also produces a smaller Cicatrix than the former.

The third and last Method of performing this Operation is, with an Instrument call'd a *Trocar*, us'd

in tapping for the Dropſy, which no Surgeon ought to be without. This Inſtrument applied to the Middle of the *Trachea*, may, as it were, at one Thruſt be paſs'd thro' the Skin, Fat, and Muſcles, into its very Cavity. Then taking out the perforating Part, let the Pipe remain in the Orifice till the Patient recovers. This Method of Operation, ſeems in one Reſpect, to have the Advantage of all the reſt, which is, that it is ſoon over, and the Pipe at the ſame Time introduc'd into the Wound with far leſs Pain to the Patient, than by any other Method: But even in this Caſe the ſame Caution ought to be us'd, and the ſame Directions follow'd, which we have above ſpecified.

If Perſons drown'd, continues *Heiſter*, are but juſt dead, their *Aſpera Arteria* is to be open'd with all Expedition, either with an Inciſion-knife, or any other Inſtrument the Surgeon ſhall judge proper. Then it is expedient ſtrongly to blow into the Orifice, either with the naked Mouth, or by Means of a common Pipe, the Shank of which is to be introduc'd into the Wound, whilſt the Aſſiſtant blows into the Bole. The learned *Detherdingius*, in a Diſſertation on this very Subject, informs us, that by this Method, if ſpeedily put in Execution, Life returns to the ſuffocated Patient, with the injected Air, and that he is in a Manner miraculouſly rais'd from the Dead. For this Reaſon the Operation ſhould in ſuch Caſes be perform'd with the greateſt Haſte and Expedition imaginable.

Mr. *Sharp* our Countryman, in his Surgery, aſſures us that this Operation is abſolutely void of all Danger, and deſcribes it in the following Manner.

Bronchotomy is perform'd, by making a longitudinal Inciſion thro' the Skin, three Quarters of an Inch long, between the third and fourth Rings,

lets of the *Trachea*, when the Operator has his own Choice of the Place; it is always advis'd to pinch up the Skin in this Operation, which however may be left to the Diſcretion of the Surgeon, who when the Skin is cut thro', muſt make a ſmall tranſverſe Inciſion into the Wind Pipe, and immediately introduce a crooked *Canula*, near half an Inch long, of Silver or Lead, with a Couple of little Rings at the Top of it, thro' which a Rib-band may be paſs'd round the Neck, to keep it fix'd in the Wound.

Some have preſcrib'd making an Inciſion thro' the Skin and Trachea at once, with a Lancet or Knife as the more eaſy and expeditious Manner, and ſays the Author, I once ſaw it perform'd in this Way, but it prov'd very inconvenient; for the Wind-pipe, in Reſpiration moving up and down, ſlipp'd from the Oriſice of the Skin, and made it very difficult to introduce the Canula, and afterwards maintain it in its Situation. Wherefore I think it abſolutely neceſſary to make an external Inciſion longitudinal, and even pretty large, as I have directed above.

The Caution of raiſing the Sternohyoidei and Sternothyroidei Muſcles before opening the Wind-pipe is not to be regarded; and as to the Diviſion of the recurrent Nerves, and large Blood Veſſels, ſo much dreaded in this Operation 'tis not in the leaſt to be fear'd, ſince they are quite out of the Reach of the Inſtrument, as any Perſon ſkill'd in the Anatomy of theſe Parts, muſt very well know.

The Method of dreſſing is eaſily underſtood; ſince after the Patient can breath by the natural Paſſage, if we withdraw the Pipe, the Wound becomes a ſimple one, and notwithſtanding its Penetration thro' a Cartilage, into a large Cavity, requires only a ſuperficial Application.

Upon

Upon the Whole it appears beyond all Contradiction, that *Bronchotomy* is a ſafe Operation, and has been ſo often perform'd with Succeſs, that no Surgeon has any Reaſon to heſitate in performing it, in Caſes where particular Circumſtances indicate its Propriety. For this Reaſon 'tis ſufficiently obvious, that this Operation ought with all Expedition to be perform'd on drown'd Perſons, many of whom have been happily reſtor'd to Life by this very Means. It is carefully to be obſerv'd, that this Expedient, is far more efficacious than blowing into a Perſon's Mouth, as is confirm'd by the following Experiment made by *Becker*. This Phyſician hang'd a Dog, till no more Motion of his Heart was perceiv'd, and having left him dead on the Ground for half a Quarter of an Hour, he to no Purpoſe blow'd Air into his Throat. Then he perform'd the Operation of *Bronchotomy*, and having thrice blown the Air into his Lungs, the Breaſt of the Dog began to elevate itſelf, and at the fifth Blaſt, he mov'd his Feet. After this he was blooded in the Throat to give Vent to the Blood, and at laſt gave ſome howling Barks, but ſurviv'd the Accident for ſeveral Years. Now as the Cauſe of Death is the ſame in drown'd as in hang'd Animals, why ſhould not the ſame Means reſtore them both to Life.

I have been very particular with reſpect to the Operation of *Bronchotomy*, becauſe it is of great Importance, and of ſingular Uſe in more Caſes than one; and that no one might be ignorant of the Methods of performing it. In the Caſe before us, that of drown'd Perſons, it may frequently be neceſſary where no Surgeon is to be procur'd ſoon enough to retrieve the Misfortune and preſerve Life. In this Situation, as there is no great Danger of injuring a Perſon, who appears to be dead, and muſt be abſo-

abſolutely ſo without immediate Relief, any common Perſon, tho' not bred a Surgeon, may by theſe Directions, be enabled to perform the Operation, by making a Perforation in the Place above directed, with any Sharp-pointed Knife. Then inſtead of a Canula or Tube of Metal, if that is not at hand, a Tobacco Pipe may be broken about three Quarters of an Inch, or an Inch, from the Bole, and the Part contiguous to the Bole may be introduc'd into the Perforation, taking Care not to break it within the *Trachea*; and then by blowing into the Bole, the Lungs may be inflated.

After having thus collected every Thing of any Importance upon the preſent Subject, we muſt beg Leave to obſerve, that, tho' with Reſpect to Matters of Religion and Conſcience, it is not only extremely abſurd, but alſo highly cruel and barbarous to invoke the Aſſiſtance and Interpoſition of the ſecular Power. Yet in the preſent Caſe, ſuch an Attempt is ſo far from being either abſurd or barbarous, that it beſpeaks Compaſſion and Humanity; for we may ſafely appeal to Experience how many worthy Members of Society, generous Friends, affectionate Huſbands, tender Parents, and dutiful Children, have in foreign Countries been reſtor'd to Life by theſe very Means; whereas in *England*, Perſons of equal Worth, have for Want of proper Care, been laid in their Graves, at a Time when they might, for many future Years have prov'd the common Bleſſings of the various Communities of which they were Members.

This melancholy and deplorable Conſideration, will ſufficiently authoriſe me to propoſe a Regulation to the Legiſlature of *England*, whoſe principal Aim ſeems ultimately to terminate in the greateſt and moſt extenſive Happineſs of the Subject. It

is,

is, that this Treatment of Persons suppos'd to be drown'd, may be enforc'd by all the Authority of the Law; and that no one may be suffer'd to be buried without it; and this under severe Penalties; for otherwise I am afraid these Endeavours of mine, however well intended, will not have the desir'd Effect, nor be attended, to so much as the Subject deserves.

AN

APPENDIX.

Concerning the Methods of restoring hang'd Persons to Life, and Children supposed to be born dead.

AS *England* is above all other Nations in the World, justly branded with *Suicide*, commonly known by the Name of Self-murder, and as our Countrymen frequently make Choice of a Rope for that Purpose, we shall briefly point out the Methods of restoring hang'd Persons to Life.

'Tis certain then, that hang'd Persons die of an Apoplexy of the sanguineous Kind, produc'd by an Obstruction of the Blood, by the Rope, in the jugular Veins, whilst the Arteries being freer from this Compression, continue to convey the Blood to the Brain. We may form a Judgment of the Effects produc'd by a Compression of the jugular Veins, from the following Passage of *Alexander Benedictus* in *Lib.* 2. *Cap.* 33. "When, says that judicious "Author, a Redundance of Blood obstructs the

"arte-

" arterial and venous Canals, and intercepts the
" free Circulation of the Spirits, the Patient falls
" down in the same Condition as if he was hang'd.
" The *Assyrians* sometimes put sound Persons into
" a similar State, when for Instance they intended
" to circumcise Achiles or Children. Thus having
" laid them on their Backs in a Bath, they com-
" press'd their jugular Veins, so as speedily to pro-
" duce a Privation both of Motion and Sensation;
" and taking the Advantage of this Circumstance,
" cut off the Prepuce with as much Ease as if the
" Patient was in an Apoplexy. The same is the
" Condition of those who having attempted to
" hang themselves, are found suffocated, tho' their
" Feet touch the Ground."

Nymman, also, in *Tr. de Apoplexia, cap.* 14. de-
clares his Sentiments on this Subject in the follow-
ing Manner. " The Functions of the Brain, says
" he, are destroy'd without any Lesion of the a-
" nimal Spirits and Nerves, as appears in a Syn-
" cope. The like happens to hang'd Persons,
" who are no sooner hung up, provided an expert
" Executioner exactly brace up the Vessels of the
" Neck, with the Rope, than they become immove-
" able as a Log of Wood, without even so much
" as moving their Feet, notwithstanding which Phæ-
" nomena, the Brain and Origin of the Nerves suf-
" fer nothing in such Persons; since those Parts are
" defended by the Cranium and Vertebræ, which
" can never be injur'd by the Rope. Nor is the
" Interception of Respiration to be accus'd as the
" Cause of Death in hang'd Persons, since tho' we
" closely shut up the Mouth and Nostrils of an
" Animal so as to hinder the Access of Air into
" the Breast, yet as the Brain still retains its vital
" Spirit, it powerfully oppoles the imminent Dan-
" ger of a Suffocation, by a violent Agitation of
" the

" the Body, and an exceſſive Motion of the Feet, " which Circumſtances are never obſerv'd in " hang'd Perſons."

From theſe Authorities we evidently ſee the ſpeedy Effects produc'd by the Compreſſion of the jugular Veins. This Doctrine is farther illuſtrated by *Bartholine* in *Cent.* 1. *Hiſt.* 32, " In diſſecting, " ſays this Author, a Man of a tall Stature, of a " ſanguine Temperament, and vigorous Conſtitu- " tion, who was hang'd for a Robbery, I found " his Lungs preternaturally large, blewiſh, ſtreak'd " with different Colours, light and ſpungious, and " ſo full of a frothy Blood, that every where on " the Membrane which covers them, the Veins " not only appear'd turgid, but the Lobes were " alſo ſo large as to embarraſs me in diſſecting the " Heart. The Ventricules of the Brain were full " of Water, as alſo the Origin of the Nerves " which enter the Spine. The *Plexus Choroides*, " alſo, beſides the Inflation of its Veſſels, con- " tain'd a great many Veſicules."

The Loſs of Knowledge in hang'd Perſons, alſo, proves the Truth of this Doctrine, and this Loſs is ſufficiently atteſted by *Camerarius* in *Cent.* 7. *Hiſt.* 40. where we are told, that a Robber being hang'd and falling into the Hands of the Surgeons for Diſſection, was nevertheleſs reſtor'd to Life, notwithſtanding his Mouth was full of Froth, which is generally look'd upon as an infallible Sign of irrecievable Death, eſpecially where it continues long, as it did in the preſent Caſe, and notwithſtanding he had before his Execution been ſeiz'd with a Fit of Madneſs. When this Man, however, was reſtor'd to Life, he ſaid he remember'd nothing of what had paſs'd on that Occaſion, except that he was conducted to the criminal Chamber, after which he was inſenſible of every Thing. This

Robber

Robber was hang'd a ſecond Time for committing freſh Robberies, a convincing Proof, that he did not look upon the firſt as a formidable Puniſhment. *Camerarius* in *Hiſt.* 38. mentions another, who was twice hang'd; and in *Hiſt.* 39. another who was reſtor'd to Life by the Phyſicians of *Vienna*, after he had been hang'd.

Lord *Bacon* in his Hiſtory of Life and Death, relates an Accident, which like that of *Camerarius*, proves the Loſs of Knowledge in hang'd Perſons. A young Gentleman of ſome Diſtinction, curious to know the Pain ſuffer'd by hang'd Perſons, having fix'd a Rope about his Neck, threw himſelf from a low Stool upon which he imagin'd he could eaſily put his Feet again; But his Attempts of this Kind were in vain, and he had been irretrievably ſuffocated, without the Aſſiſtance of a Friend who had the Curioſity to be preſent at ſuch an unaccountable Experiment. Upon his Recovery, his Friend aſking him if he had felt any Pain; he anſwer'd that he had perceiv'd none in any Part of his Body; but added, that at firſt he obſerv'd before his Eyes, a Species of Fire or blazing Light; then an extreme Darkneſs, and laſt of all a pale Blue, or a Sea-green, like that which frequently preſents itſelf before the Eyes of thoſe who fall into Deliquiums. Lord *Bacon* ſubjoins, that he heard a Phyſician of Candour and Worth, aſſert, that he had reſtor'd Life to a Man who had been hang'd half an Hour, affirming at the ſame Time, that by proper Means the ſame Effect might be produc'd upon others, who had hung no longer, provided the Effort of their firſt Fall had not luxated the Vertebræ of their Necks.

After having thus diſcover'd the Cauſe of Death in hang'd Perſons, we are the better able to form

a

an Eſtimate of the Means moſt proper to reſtore them to Life.

Frictions then, and hot Baths, by reſtoring the Motion of the Blood, and reſolving its Coagulation, muſt for theſe very Reaſons produce happy Effects on hang'd Perſons. *Pechlinus* in *Tr. de Aer. & Aliment. Defect. cap. 7.* relates an Obſervation, which ſufficiently evinces the Efficacy of Sal Ammoniac on ſimilar Occaſions. "I knew, ſays "he, a Woman hang'd, who after ſhe had re"main'd for ſome Time without Pulſe and Reſpi"ration, with her Lips cover'd with Froth, which is "look'd upon as an infallible Sign of the total Pri"vation of Life, and in a Word, after ſhe appear'd "to be the neceſſary Victim of Death, was yet re"ſtor'd to Life, by a Phyſician who coming acci"dentally to the Place where ſhe lay, made her ſwal"low a conſiderable Quantity of the Spirit of Sal "Ammoniac." As the Activity of this acrid volatile Liquor, and its Propriety to reſolve coagulated Blood are ſufficiently known, it is by no means ſurpriſing, that it ſhould on ſimilar Occaſions produce ſuch happy Effects. "*Pechlinus* ſubjoins, I "don't in the leaſt doubt, but if proper Meaſures "were taken in due Time, a great many hang'd "Perſons might be reſtor'd to Life, even after "thoſe who have an Opportunity of ſeeing them, "think they have all the Reaſon in the World, to "conclude them really and irretrievably dead. "This Effect is moſt commodiouſly produc'd by "reſtoring the Circulation of their Blood, by "means of Frictions, Veneſections, and the Ex"hibition of hot and ſpirituous Remedies, or of "ſome other analogous Subſtances."

It is ſufficiently eaſy from what we have before ſaid, to conceive, how Veneſection is excellently calculated for reſtoring Life to hang'd Perſons,

and as for ſpirituous Liquors, they act at once on the Blood and Veſſels, by attenuating the former, and reſtoring the proper Spring and Tone of the latter. The Remedies of this Kind are before ſpecify'd.

Schenkius in Obſervat. Art. de Suffocat. ex Laqueo, orders that drown'd Perſons ſhould be made to ſwallow Vinegar and Pepper; or Oxymel mix'd with the Powder of Penny-royal. He, alſo, adviſes to excite a Vomiting by means of a Feather dipt in Oil, and to wrap up the Patient's Neck in a Woollen Cloth dipt in warm Oil, eſpecially the Oil of Orris.

The Virtues of Oxymel, or of ſimple Vinegar with Pepper, are ſufficiently evinc'd by *Chriſtophorus de Vega Art. Med. Lib. 3. Sect. 5. Cap. 8.* All Phyſicians are ſufficiently appriz'd, that Vinegar moderately us'd, is a powerful Reſolvent, whilſt Pepper is an acrid Subſtance, equally proper to diſſolve the Coagulations of the Juices, and reanimate the Fibres, by the Irritation it produces in them. The Powder of Penny-royal is, alſo, an acrid Aromatic, whoſe Effect muſt of courſe be nearly the ſame with that of Pepper.

As for exciting a Vomiting in hang'd Perſons, I think it more dangerous than in thoſe who are drowned; for the Contractions of the Muſcles ſubſervient to Expiration, may ſerve to reſtore that Function as we have already obſerv'd, ſince the Inflation of the Abdomen and Breaſt of hang'd Perſons, is a Proof that their Inſpiration is forc'd and unnatural, yet in ſuch Circumſtances it ſeems dangerous to convey a greater Quantity of Blood to the Head which is before overcharg'd with it, as is ſufficiently obvious, not only from the preceding Hiſtories, but alſo from the livid Colour of the Countenance. It is, however, certain, that the Shocks given to the Parts by means of the Vomiting, are very proper

proper to diſſolve the Coagulations of the Blood, though I would never adviſe the Uſe of this Method, till after a previous Veneſection.

The Topic mentioned above, which *Schenkius* orders to be applied to the Neck, may produce very happy Effects, by reſolving the Blood collected in the Skin and Muſcles of the Neck, and relaxing the Parts which had ſuffered moſt immediately by the Rope.

Geſner, for a Girl who hang'd herſelf, ſucceſsfully ordered Powder of Caſtor, which he forc'd down in warm Broth. This Remedy is alſo of a volatile and reſolvent Nature. *Joubert. in Lib. 4. de Effect. Thor. Cap.* 1. informs us, that he reſtored many hang'd Perſons to Life, without ſuch a Multiplicity of Expedients; ſince he uſed no other Method than Veneſection, and forcing into their Stomachs a due Quantity of good Wine.

Ranchinus in Tr. de Morb. ſubit. Cap. 12. orders Oil of Orris, or of Lillies, to be applied to the Necks of hang'd Perſons, whilſt their Mouths are to be gargariz'd with Syrup of Violets, diſſolved in warm Water, or Barley-water. He alſo preſcribes Vomiting, excited by a Feather, in order to enlarge the Paſſages more. The ſame Author alſo recommends Pepper and Penny-royal, either in Vinegar, Oxymel, Wine, or the *Aqua Cæleſtis*. But Veneſection is the Expedient on which he depends moſt for happy Effects. The Oils and the Syrup are only intended to procure a Relaxation; and as for the Gargariſm, it cannot be us'd till the hang'd Perſon is previouſly reſtored to Life. The Pepper, Penny-royal, and other Subſtances mentioned by him, are deſign'd to re-animate and reſtore the natural Heat.

Aelius in Tetrabibl. Serm 8. *Cap.* 49. orders us to add to the Pepper and Vinegar, Nettle-ſeeds, which are alſo of an highly acrid Nature. The ſame

Author affirms, that when the Redneſs round the Neck of hang'd Perſons is diſſipated, they open their Eyes, and the Parts are relaxed. He is alſo of Opinion, that we ought not to ſpare Fomentations of the Neck, with warm Oils, Cerate, or Woollen Cloths.

Ranchinus, from other Authors, greatly extols a Remedy which moſt People will think as ſingular in itſelf as diſagreeable to the Perſon who adminiſters it. It conſiſts of blowing into the Mouth of hang'd Perſons, provided the Adminiſtrator has in his own Mouth, a bruis'd Nutmeg, Cinnamon, Cloves, or Carraway-ſeeds. As it is certain, that theſe Aromatics produce no other Effect, than impregnating the Air with ſome volatile Parts, proper to reſtore the Motion of the Fluids, ſo 'tis equally certain, that the principal Efficacy of this Practice depends upon the *Blowing*, which in this Caſe muſt infallibly produce Salutary Effects; as is obvious from the following Experiments, recorded in N°. 28. of the Philoſophical Tranſactions of the Royal Society of *London*.

Firſt then, Doctor *Croon*, Profeſſor of *Greſham-College*, in the Preſence of the Royal Society, ſtrangled a Pullet, in ſuch a Manner, as that it diſcovered no more Signs of Life; but by afterwards blowing into the *Arteria Trachea*, he ſo effectually reſtored the Motion of the Lungs, that the Pullet returned to Life.

Secondly, Doctor *Walter Needham*, in the Preſence of Mr. *Boyle*, and other *Literati*, hang'd a Dog, till the Motion of his Heart was no longer to be perceived, after which he open'd the Abdomen of the Dog, and blowing into the Thoracic Duct, reſtored the Motion of the Blood, upon which the Heart began to beat, and the Dog returned to Life.

Thirdly,

Thirdly, Doctor *Hook*, in the Preſence of the Royal Society, cut the Ribs, the Diaphragm, and Pericardium of a Dog, after which, making an Inciſion in the ſuperior Part of the *Trachea*, he introduced into it the Pipe of a Pair of Bellows; then he blow'd the Air into the Lungs, and the Dog returned to Life; but died when he ceaſed to blow: By which Expedient he made him live and die alternately, as long as the Company pleas'd.

A *fourth* Experiment is that of *Becker*, by which he reſtored a hang'd Dog to Life, by opening his Larynx, and blowing the Air into his Lungs, through the Inciſion made; ſo that the Practice enjoined by *Ranchinus*, is by no Means to be neglected.

Upon the whole, the firſt and fourth Experiments are abſolutely the ſame with the Practice recommended by that Author. Now, Why may not that which has ſucceeded twice, ſucceed oftener? Though the other Experiments doe not ſo directly prove the ſame Truth, yet it may be eaſily deduc'd from them; for from the ſecond it follows, that the Air is not only neceſſary to the Circulation, becauſe by dilating the Lungs it gives a free Paſſage to the Blood, from one Ventricle of the Heart to the other, but alſo is requiſite to keep the Blood in ſuch a State of Solution, as Circulation requires. Now, by blowing Air into the Lungs, we inflate their Veſicles, which is the firſt Advantage produced by Reſpiration; and the Air by this Means inſinuating itſelf into the Blood, reſolves its Coagulation. By means of this Explication, 'tis eaſy to comprehend how Doctor *Hook*'s Experiment favours the Doctrine of *Ranchinus*.

From what has been ſaid, we may therefore conclude, Firſt, that blowing in the Mouths of hang'd Perſons is a proper Method of reſtoring them to

Life; Secondly, That if this Method does not ſucceed, we are to perform the Operation of *Bronchotomy*, and by that Means blow Air into their Lungs: *Thirdly*, That we ought not to be diſcouraged at ſome fruitleſs Attempts, becauſe a Practice, which with *Becker*, did not ſucceed till the fifth Time, may perhaps, in other Circumſtances, not ſucceed till later: Fourthly, That we muſt not at the ſame Time, neglect theſe other Means, which have a Tendency to reſtore the loſt Fluidity of the Blood: Fifthly, That if Death does not ſucceed Strangulation, this is rather the Effect of the Stiffneſs of the Cartilages which compoſe the Larynx, or according to ſome, of the Slackneſs of the Rope, than of the eaſy Diſpoſition of the Blood to reſume its Fluidity: Sixthly, That it is highly probable, that an efficacious Method of reſtoring drown'd Perſons to Life, would be, to inject Air into the Blood, by introducing a ſmall Pipe into ſome of the larger Veins, for that Purpoſe; For what Difference is there between making the Air enter the Blood by the Thoracic Duct, or by any other Part. The only Caution which I think ought to be given, is, to make choice of thoſe Veins moſt contiguous to the Heart; ſo that for this very Reaſon, as well as for their Largeneſs, and the Facility of finding them, I judge the external Jugulars moſt proper for this Purpoſe.

Having already obſerved, that as the Cauſe of Death is the ſame in hang'd and drown'd Perſons, ſo the Meaſures taken for the Relief of the one, may be alſo uſed for reſtoring the Lives of the others, We proceed to give ſome Hiſtories of Facts, which prove the Poſſibility of reſtoring ſuffocated People to Life.

Mr. *Falconet* then, a Gentleman of ſtrict Probity and Candour, told Dr. *Brubier*, That his Father had

had a fool-hardy Coachman, who falling into a Quatrel at *Lyons*, killed a Man, and being apprehended on the Spot, was forthwith condemn'd to be hang'd, which Sentence was accordingly put in Execution. The Surgeons of the Town having obtained his Body, in order to make a Skeleton, brought it into a Surgery, where they left it upon a Table; but when they came next Day to diſſect it, they were ſurprized to find the Man not only alive, but in good Health, and piſſing in the Chimney, for want, as he ſaid, of a Chamber-pot.

This Man had ſtood in no Need of Remedies, certainly, for no other Reaſon, but becauſe the Circulation of the Blood had not been ſo long ſuppreſſed, but that it could of its own Accord reſtore itſelf.

Oſwaldus Gabelchaverus relates, in one of his Obſervations quoted by *Schenkius*, the Hiſtory of a Merchant of the Name of *Landthaler*, who was hang'd on a Tree for ſome Villanies he had committed: He hung for a whole Hour, and the Servants who had Orders to inter him, having cut the Rope, perceived, as they thought, ſome Marks of Life in him, upon which they put him in a Cart, convey'd him to a proper Place, and ſoon reſtored him to Life. He afterwards us'd to ſay, that he was ſenſible of no Pain in hanging, except in his Eyes, and the Extremities of his Toes. About eighteen Years after, however, he began to follow the ſame Practices, for which he had been hang'd before; but *Prince* Charles *of Aremberg* ordered him to be hang'd a ſecond Time, in ſuch a Manner, that he never returned to Life.

Cæſarienſis in Illuſtr. Mirac. Lib. 6. Cap. 24. relates the Hiſtory of a certain Robber, who had been hang'd a little before, a Servant belonging to a Canon of *Cologne* happened to come up to the Gallows,

Gallows. The Servant imagining there were ſtill ſome Remains of Life left in him, cut the Rope, and reſtored him to Life, by ſome cold Water taken from an adjacent Rivulet. The Robber, in the mean time, gradually reſuming his Strength, followed his Deliverer, who was going to the next Town, and juſt as they were talking with each other, the Robber laid hold of the Bridle of the Servant's Horſe, cried out aloud, that the Horſe belonged to him, and ſwore that the Servant had robb'd him of him: This Debate having drawn together a large Concourſe of People, their Indignation was ſo ſtrongly moved againſt the Servant, that without hearing what he had to ſay in his own Juſtification, they were determined to drag him to the Gallows from which he had lately cut down the Robber: but luckily for the Servant, ſome Inhabitants of the neighbouring Town, ſeeing a Concourſe of People going to the Gallows, which belonged in common to both Towns, came to ſee what the Matter was: then the Crowd ſuffering the Servant to ſpeak, he related his Adventure, and the Manner in which the Robber had recompenc'd his Service. The Robber being at laſt known, was a ſecond Time hung upon the ſame Gallows, in ſuch a Manner as not to return to Life.

Though the Ground-work of the following Hiſtory reſembles the preceeding, yet it differs from it in many Circumſtances, the moſt conſiderable of which is, the long Time the Criminal continued hang'd.

A Miller near *Abbeville* in *France*, happening to goe near the Place where a Robber had been hang'd the Day before, ſuſpected that he was not dead. Compaſſion having induc'd him to ſatisfy his Suſpicion, which was well-founded, he cut him down, laid him in a Cart, convey'd him to his own Houſe, and

and uſed ſuch effectual Means to reſtore him to Life, that in fifteen Days the Robber recovered perfect Health. The Miller upon this intended to give him a little Money, and take his Leave of him; but delaying for ſome Time to put that Intention in Execution, he left him one *Sunday* alone in his Houſe; the miſerable Wretch forgetting what he owed to his Deliverer, broke open a Cupboard, and carried off all the Plate and ready Money he could find. The Miller, upon coming home, and finding his Houſe robbed, eaſily concluded, that his Gueſt was the Perſon who had done it: accordingly the Miller, his two Sons, and a Cart-driver, purſuing the Robber, overtook him about a League off, and dragging him to the Gallows, whence he had been cut down, hung him up a ſecond Time, and gave him ſuch Shocks, that they put it out of his Power to commit any more Robberies. It is about forty Years ſince this Accident happen'd; and Doctor *Bruhier* informs us, that it is atteſted by Perſons of the beſt Reputation in *France*; and a Pardon was actually procured for the Miller, his Sons, and Servant, who took the Liberty of executing the Robber, without legal Authority.

Before we put an End to this Treatiſe, which we intend for the common Good and Benefit of Mankind, we ſhall ſay ſomething with Reſpect to the Methods of preſerving the Lives of Children, who appear dead when born. No two Abuſes then, are more prejudicial to Society, contrary to Humanity, or inconſiſtent with Reaſon, than to inter Women big with Child, without performing the *Cæſarian* Operation upon them; and without any Attempts of Relief, totally to abandon Children who ſeem to be born dead.

The former of theſe Abuſes is founded on two Errors; the firſt of which is, that the Infants do not ſurvive their Mothers, when they die near their

Time; and the ſecond, that the Lives of Children depend abſolutely on thoſe of their Mothers. Now theſe two Errors are deſtroyed by ſeveral Hiſtories, which prove, that the Death of the Mother does not neceſſarily produce that of the Child.

Caſpar Reies, then, in his *Campus Elyſius Jucundarum Queſtionum*, relates from *Cornarius*, "That "a Woman of *Madrid*, of the illuſtrious Houſe "of *Laſſo*, being reputed dead, after remaining "three Days, in the utmoſt Agonies, was put in- "to the Tomb belonging to the Family, which "being open'd ſome Months after, her Corps was "found, with an Infant tenderly graſped in her "right Arm; for, continues the Author, the "Woman was pregnant, and near her Time, "when ſhe was interr'd as dead."

The following Hiſtory is alſo related, by the ſame Author, and atteſted by ſome of the moſt learned and judicious Men in *Spain*.

"The Wife of *Francis Arevallo de Swaſſo*, fell "ill in the City of *Segovia*, during the laſt Months "of Geſtation: However, as ſhe died, or rather "was taken for dead, in a few Days ſhe was in- "terr'd, according to the Cuſtom of the Place. "The Huſband, in the mean time, who was ſent "for to a Place at a conſiderable Diſtance, whi- "ther he had gone about ſome Buſineſs, came "home about the Middle of the Night, and being "informed that his Wife, whom he loved to Ex- "ceſs, was dead and buried, he would at any Rate "have the Satisfaction of ſeeing her once more: "For this Purpoſe, he went to the Church, and "ordered her to be raiſed from the Grave; hard- "ly was the Coffin open'd, till the Cries of an In- "fant were heard; the By-ſtanders were aſtoniſh- "ed, a Juſtice was called, the Prieſts, and a great "many others got Flambeaus, and attended the

"Huſband;

" Husband; the Shroud was lifted up immedi-
" ately, upon which appeared the Head of an In-
" fant, making a vigorous Effort to disengage the
" Rest of its Body from the Vagina. This Infant
" was not only extracted, sound, and alive, but al-
" so lived to be Lieutenant General of the City of
" *Cherez*. The surprizing Manner in which he
" came into the World, laid a Foundation for his
" being called, *The Son of the Earth*.

From these Histories, *Caspar Reies* draws the following Consequences. " 'Tis evident that " Children dont die with their Mothers when the " latter die near the Periods of their Deliveries. " *Sennertus* affirms, not only that they live for " some Time after their Mothers are dead, but " also that we may, and even ought, to extract " them alive from the Uterus, *Vincelius* has com-" pos'd two Treatises in order to prove these " Truths, which are also sufficiently establish'd in " the Dissertations of *Nymman*, *De Vita Fœtus in Utero*, where, as well as in other Authors we " find a great many similar Histories; and others " of Women who have been deliver'd of live " Children after their own Death. The Reader " may also consult *Raynaud de ortu Infantum contra Naturam*. Hence 'tis obvious, that we ought " not to be too rash and precipitate in burying " pregnant Women who die near their Times. I " am not certain whether these Women were dead " or alive at the Time of their Interment, tho' it " appears evident from the Circumstances, that " the first was buried alive; for *Horstius* proves " from another Fact, that dead Women may be " deliver'd of Children. Thus he informs us that " a Woman big with Child, being hang'd along " with her Husband by the *Spanish* Soldiers, be-

" tween *Deventer* and *Zutphen*, was four Hours " after her Death, deliver'd of live Twins."

Thomas Bartholin in *Act. Hafn. An.* 1673 relates an History which proves the ſame Truth, and which is, " That of a Child born two Days after the " Death of its Mother, which happen'd in a La- " bour, in which three Midwives had employ'd all " their Art and Skill. Thus 'tis certain from Ex- " perience, that dead Women may be deliver'd of " live Children, and this has perhaps laid a Foun- " dation for the whimſical and ſuperſtitious Practice " of putting into the Coffins of Women who die " big with Child, a Needle, a Thread, and a Pair " of Sciſſars, as if the Manes ſtood in Need of " thoſe Inſtruments to tie and cut the umbilical " Chord of the Infant about to be born. In ſhort " it has been obſerv'd, that Infants have been " born in the Coffins of their Mothers.

The ſame Author alſo mentions a Woman who in 1635, on *Thurſday* about 9 o'Clock at Night died of Epileptic Fits. On the *Friday* the Foam was diſcharg'd from her Mouth, Cries reſembling thoſe of an Infant were heard, and a ſenſible Motion was obſerv'd in the Abdomen of the Mother. On *Saturday* about 10 o'Clock in the Morning, the Woman diſcharg'd a great deal of Blood, ſo that on changing her Linnen, her Infant ſtill warm, was found lying betwixt her Thighs. *Bartholin* adds, that the Phyſicians of the Town were of Opinion that the Mother had only died when her Mouth became full of Froth, without which Circumſtance the Infant could not probably have liv'd.

In the *Miſcellanea Naturæ Curioſ.* we have Inſtances of Women who have died near their Time, and been deliver'd ſometimes of dead, ſometimes of live Children, ſometimes one, two, and three Days after their Deaths. Theſe Inſtances are recorded

corded by *Reſler*, firſt Phyſician to the Prince of *Brieg* in *Obſ.* 318. *An.* 3. By *Poliſius* in *Obſ.* 42. *An.* 4. By *Doleus* in *Decur.* 2. *An.* 5. *Obſ.* 137. By *Hoyer* in *Decur.* 2. *An.* and laſtly by *Hartmanus* in *Obſervat.* 83. of the ſame Volume.

From what has been ſaid 'tis ſufficiently obvious, that thoſe Perſons are greatly miſtaken who ſuppoſe that the *Fœtus* does not ſurvive its Mother; for it is evinc'd from a Number of Obſervations, that the Life of the *Fœtus* is ſuſtain'd by a Circulation peculiar to itſelf; that the umbilical Arteries, which terminate in the Placenta, convey thither a Quantity of Blood, which is carried back by the umbilical Vein, without paſſing to the Mother; and that, if this Blood undergoes any Change, it is only from a lymphatic or lacteal Liquor, which the Roots of the Placenta imbibe from the uterine Veſſels. Theſe Truths are at preſent univerſally agreed upon; ſo that before the Death of the Mother can deſtroy the Life of the Child, 'tis neceſſary to prove, Firſt, That the lacteal Liquor ceaſes to be filtrated immediately after the Death of the Mother: Secondly, That the Suppreſſion of this Filtration is an infallible, or even neceſſary Cauſe of Death. In Conſequence of this, we muſt prove, that at every Circulation, the Juices of the *Fœtus* have their nutritive and vivifying Principles exhauſted; and that the Fœtus is incapable of ſuſtaining in the Uterus a Degree of Faſting, which it often ſupports for ſeveral Days after it is brought into the World. Now, as theſe Propoſitions cannot be proved, ſo it cannot be evinced, that the Death of the Mother is neceſſarily ſucceeded by that of the *Fœtus*; ſo that 'tis certain, we commit manifeſt Homicide, by interring pregnant Women near their Time, without performing the *Cæſarian* Operation upon them.

This

This is no new Doctrine, ſince in the *Digeſt Lib. 4. Tit. 8.* theſe Words occur; "A Royal E-"dict prohibits the Interment of dead pregnant "Women, before we have delivered them, by "Means of the *Cæſarian* Operation. Thoſe, who "do otherwiſe appear, to have deſtroyed with the "pregnant Woman the Hope of obtaining a living "Man." It is highly to be lamented, that this Law is not univerſally put in Execution, ſince it is a Principle founded on the eternal and unalterable Nature of Things; *That we kill thoſe whom we do not preſerve, when we have it in our Power.*

If it ſhould be objected, that this Operation would, if not always, yet at leaſt very often, prove an uſeleſs Attempt, I anſwer, that it is, an eaſy Operation, ſince it is performed by two or three Strokes of the Biſtory, and a few Stitches of a Needle. Beſides, though Children after this Operation ſhould appear dead, yet we are not to truſt to thoſe Appearances, unleſs Putrefaction ſhould remove all Doubt.

Bhonius informs us, that the Faculty of Medicine at *Wurtemberg* being conſulted, in a criminal Proceſs rais'd againſt a Mother for killing her own Child, anſwered, that Children were ſometimes born ſo weak, as to appear for a conſiderable Time without Senſation, Motion, and Reſpiration; and that it was neceſſary to uſe vellications, Fomentations, Aſperſions of Wine, Spirits of Wine, or *Aqua Vitæ*; as alſo to make them ſwallow aromatic Liquors, or blow ſpirituous Liquors into their Mouths and Noſtrils, till they begin to cry, which is an infallible Mark that the Air has entered the Lungs.

As to theſe Meaſures, we have before ſhewn, that they have an evident Tendency to reſtore Life. But we muſt not here paſs over a Practice, which, of

of all others ſeems to be of the greateſt Importance to ſtill-born Children, which is, the ſucking the left Nipple of the dead Fœtus. This Method, as we are told in *Ephemerid. Natur. Curioſ. Dec. 2. An. 5.* prov'd ſucceſsful, after vellications, Frictions, ſpirituous Liquors, and other Methods had been tried in vain. Various other Inſtances of the Succeſs of this Practice are found in the ſame Work, and in the Writings of other practical Authors. Though this Method may at firſt ſeem ridiculous, yet it will appear of the laſt Importance to the Anatomiſt, who knows the Senſibility of the Breaſt, all whoſe Nerves center in the Nipple. *Hannemaun* alſo, orders a Sponge dipt in Red Wine, or *Aqua Vitæ*, to be applied to the left Breaſt, and Pit of the Stomach, of ſtill-born Children. *Heiſter*, when ſpeaking of ſuch new-born Children, as are exceſſively weak, or hardly appear to be alive, orders a robuſt, ſound Man to breath into their Mouths, immediately after he has drank a Dram of Brandy.

The laſt Method of reſtoring ſtill-born Children to Life is, to blow into their Mouths, as is obvious, from various well-atteſted Obſervations, with two of which we ſhall put a Period to this Work.

Borelli in Hiſt. Cent. 3. Obſerv. 58. relates, that a Servant returning from the Fields, and finding his Maſter, whom he greatly lov'd, lying dead, he embraced him for a long Time, and by accidentally breathing in his Mouth, gradually reſtored him to Life.

The learned *Grubelius*, in *Miſcellan. Nat. Curioſ. Dec. 2. An. 10. Obſ. 44.* informs us, that whilſt a Phyſician was preparing the Remedies proper to reſtore to Life, a Woman, who had fallen into ſuch a *Syncope*, that ſhe was thought dead, her

her own Servant, who had a great Attachment to her, reſtored her to Life by blowing in her Mouth. But 'tis probable, that this Method produces its happy Effects, rather by reſtoring the Motion of the Blood and Lungs, than by Means of that vivifying Principle, which ſome ſuperſtitious Authors ſuppoſe to be lodg'd in the human Breath.

FINIS.